

THE
A C A C I A T R E E,

ROBINIA PSEUDO ACACIA:

ITS
GROWTH, QUALITIES,
AND
USES.

WITH
OBSERVATIONS
ON
PLANTING, MANURING, AND PRUNING.

BY W. WITHERS,

HOLT, NORFOLK,

AUTHOR OF A MEMOIR ON THE PLANTING AND REARING OF
FOREST-TREES, ETC., ETC.

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12

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TO HIS GRACE
THE DUKE OF PORTLAND,

THE
FOLLOWING TREATISE
ON
THE ACACIA TREE,

IS,

BY HIS PERMISSION,
MOST RESPECTFULLY DEDICATED

BY HIS GRACE'S
MOST FAITHFUL AND OBEDIENT SERVANT,

W. WITHERS.

HOLT, April, 1842.



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INTRODUCTION.

IN presenting this TREATISE UPON THE ACACIA to the public, the author feels called upon to state distinctly at the outset the object which he had in view, and the reasons which have induced him to undertake it. To do this in a few words would be impossible : in justice therefore to the subject, which he believes to be one of great national importance, he would solicit the reader's attention to the following detail of the construction of the work and its materials.

The ACACIA TREE, or as it is erroneously but too commonly called, the LOCUST TREE of *America* (botanically *Robinia pseudo Acacia*, *Linn.*), is, notwithstanding all that has been written or said of it, but very imperfectly known in Britain.

It has been cultivated in our nurseries, for a very long period, introduced as an ornamental tree into our shrubberies, and its foliage universally admired; but, nevertheless, its qualities, habits, modes of culture, duration, and general value as a timber-tree, have not been understood or duly appreciated.

The author having long been satisfied, upon evidence which to his own mind is perfectly conclusive, that the *Acacia* as a timber-tree is invaluable, and that its absence from our groves and forests is a serious loss to the nation, determined to collect all the evidence that lay scattered abroad, to embody it, and to present it to the public in general; and more especially to those, whose object it is, or may become, to raise plantations of the best and most useful trees, in the hope that the work might bring it into more prominent notice, and at the same time inspire confidence of a profitable and successful issue.

Although planting is a delightful pursuit, in which land-owners in general take a great interest, there are too many who cannot divest themselves of the idea, that they are planting for posterity and not for themselves. This consideration has frequently prevented the planting of the most valuable timber-trees, as we naturally shrink

from an undertaking the full advantage of which we cannot reasonably expect to enjoy ourselves. Those trees which we have been in the habit of viewing as the noble denizens of our forests are slow in growth—ten, fifteen, twenty years, witness but little comparative increase in their progress: still, however, as the author has elsewhere* shown and proved, when land is properly trenched, manured, and kept clean, trees, even of the most tardy growth, will make surprisingly rapid progress, and quickly yield a profitable return.

But in the ACACIA we find a tree, which, to the other excellent, nay surpassing, qualities it possesses, adds that of very rapid growth: so rapid indeed, as to insure a reasonable prospect that the planter, even if he be advanced in years, may reap the fruits of his labors, and obtain timber of considerable size and bulk, adapted to purposes of extraordinary utility. This then being the conviction of the author's mind, he resolved to collect materials wherewith to construct a complete history of the ACACIA TREE, and the work now produced is the result of his determination.

* Memoir to Society of Arts, 1826—Letter to Sir Walter Scott, 1828—
Letter to Sir Henry Steuart, 1829.

It remains then to describe the materials which have been employed, that the reader, before he enters upon the perusal of the treatise, may be fully aware of its character.

A work was written in *France* during the stormy period of the Revolution, that is, at the close of the last century, when the directory was succeeded by the consular government of NAPOLEON. The author was the celebrated citizen, M. FRANÇOIS DE NEUCHATEAU, a man who appears to have had the interest of his country at heart. He not only strenuously endeavoured to introduce the general culture of the PSEUDO ACACIA into *France*, but planted it largely himself. This work appeared to the author to be exactly in accordance with the object he had in view, and he laid it before a correspondent, who, after a careful perusal, undertook to translate it and adapt it to the English reader of the present day. It happened, fortunately for the furtherance of this plan, that in this gentleman (the AUTHOR of the *Domestic Gardener's Manual*) the compiler met with a coadjutor, who took not only a lively interest in the intended work, but was prepared, by his own critical experiments upon the tree, not only to discover and appreciate the merits of the French treatise, but to speak to and corroborate such facts as had come under

his own immediate observation. In performing his allotted task, this gentleman did not affect to translate the work literally. Perfectly aware of the gallicisms with which the original abounded, he not only determined to avoid these as much as possible, but to omit a variety of useless repetitions, and curtail certain redundancies, which to an English reader would be found unprofitable and wearisome. The translation therefore is free, but faithful. The work of M. NEUCHATEAU is comprised in above 300 pages of a small 12mo volume: it consists first of an original letter written to a Friend, who was desirous to plant the ACACIA in a large way, upon his own property at a distance from *Paris*. M. DE NEUCHATEAU writes with enthusiastic zeal: he details his own experience, and refers to a number of French, German, and English Authors, from whose treatises and pamphlets he has extracted largely. His own letter occupies about eighty pages of the book, the remainder consists entirely of the opinions of others. These authorities, thus collected, furnish themselves a body of evidence, and indeed a complete history of the tree, from its first introduction into Europe during the reign of KING HENRY THE FOURTH of *France*, by JEAN ROBIN, who held a high official situation in the royal garden.

In the quotations from the authorities adduced by M. DE NEUCHATEAU, the English reader will find a condensed view of the several methods of cultivation adopted by American, French, and German planters. Some of these writers were evidently men of sound practical discernment and skill—others evince a degree of zeal somewhat beyond their knowledge; and these circumstances have led to anomalies, contradictions, and exaggerations, which perhaps, while they are to be lamented, are it must be admitted of but too common occurrence. The truth however shines out through the whole: we can trace it distinctly; and though there are points on which some doubt must exist, a mass of evidence is afforded, from which it must be apparent, that in the ACACIA we have a tree of no common merit, of ready culture and extraordinarily rapid growth: its wood, moreover, may be rendered extensively available by, and useful to, the shipwright, the carpenter, the joiner, &c., and in works of the greatest importance to the mercantile interest, the British navy, the homestead, and the farm.

To the authorities cited in the above work is subjoined an extract from a Letter, published by M. MEDICUS, who, with a zeal and energy peculiarly his own, devoted his time and attention to

the culture and extension of the ACACIA throughout Germany. This is followed by a most interesting though much abbreviated article from the French Encyclopædia. The author hoped to procure the original article upon the PSEUDO ACACIA contained in that elaborate and learned work ; but, by some confusion arising from the inappropriate title attached to the tree, the extract sent over from Paris was taken from the article "ACACIA ;" and when the mistake became apparent, it was too late to remedy it. This simple circumstance points out the folly of continuing to apply the term ACACIA to a species, which bears only a distant relationship to the hardy forest-tree which forms the subject of this treatise. The true ACACIA (*Acacia Vera*) is a genus, which comprises a number of trees, natives exclusively of tropical climates : it is unconnected with and remote from the hardy tree of North America—*Robinia pseudo Acacia*—and ought not to be confounded with it. M. DE NEUCHATEAU was fully aware of the confusion to which the misapplication of the term tended. He therefore suggested the substitution of the title, "*Robinier*" for that of ACACIA ; and in England we might with great propriety style the tree, "ROBINIA" or "ROBINIA ACACIA." The extract from the Encyclopædia alludes indeed to the false ACACIA, but gives no description of it ; and the

compiler hesitated whether he should introduce it or not. However, as it is an article of great interest, one which describes a genus of trees of great importance to commerce, and affords much valuable information concerning the source from which Europe has for centuries been supplied with the Gum Arabic, now known as *Acacia Gum*; and finally, as it was written by the renowned traveller, M. ADANSON, one of the first botanical authorities of the day, he at length was induced, however irrelevant it might appear to be, to let it form a part of the work.

To this succeeds a copious extract from the Works on Forest-Trees of the French traveller, MICHAUX. His authority is of high importance, and will not be disputed by those who are acquainted with his Works.

In endeavouring to collect evidence from the writings of British authors, the compiler found that the tree had then been noticed by very few. He has, however, introduced an extract from MILLER'S *Gardener's Dictionary*, another from that excellent and entertaining work GILPIN'S *Forest Scenery*, and some short quotations from the *Encyclopædia of Gardening*. Fortunately the subject of the ACACIA has been discussed at length in "*The Woodlands*," by MR. COBBETT.

The author has drawn largely from this fruitful source ; and it is but just to acknowledge, that the information conveyed by the able writer is not only exceedingly valuable, but is conveyed in language, the zeal of which stamps him, as what he in truth was, the apostle of the cause which he so strenuously advocated. The planter, whatever the prejudiced may say to the contrary, is much indebted to MR. COBBETT for the truly practical instructions which he has given on this subject, so important in rural economy.

With these Extracts from the Writings of Foreign and British Authors, the first part of the work is completed. The second includes letters, or extracts of letters, received from numerous parties, the persons best calculated to afford testimonials of the state and condition of the trees now growing in Britain, which may have come under their observation. Many of the author's correspondents are noblemen and gentlemen of high rank and talent : others are professional men, whose evidence of the strength and durability of the wood must be deemed conclusive.

Among the correspondence, he must notice particularly a letter, the original of which is in

his possession, from M. MILLER, the late able conductor of a valuable French Work, "*Le Journal des Forêts.*" It is to be regretted that the work was discontinued about the Revolution of 1830 ; and this circumstance, added to the silence of M. MILLER, leads to the conjecture, that the admirable writer of the letter fell during the struggle of "the three days."

The testimonial by the compiler's friend, the *Author of the Domestic Gardener's Manual*, may be particularly alluded to, inasmuch as it details a course of culture from the year 1830 to the summer of 1834. The trial commenced with minute experiments upon the modes of promoting the germination of seeds, by the application of water of different degrees of temperature, and in some instances by the application of chemical solutions. Every part of the experiments, and every stage of the progress of the trees, is particularly and minutely described ; and the reader is thus furnished with a standard, by which the directions given by several of the French cultivators may be compared and tested with the practical results of experiments and careful observation in our own climate.

The author has thus entered into a detail of

those parts of his work which treat exclusively of the *Pseudo Acacia*; and he ventures to hope that the treatise will be found to comprise a more comprehensive and perfect history of the tree, than has ever yet been presented to public notice. In fact, as has been already announced in the prospectus, he confidently believes that the work will contain, not only a complete detail of the history, character, and growth of the tree, with the most approved methods of cultivating it, but also an ample and satisfactory enquiry into the strength and durability of this truly valuable wood, when applied to the purposes of joinery, cabinet-work, machinery, ship-building and repairs, farming implements, gate-posts, rails, door and window sills, hop-poles, and other out-door uses.

Planting may, however, be carried on, and yet fail in its results, for want of practical directions or suitable experience. This remark applies not only to the *Robinia*, but to all other trees.

“A tree,” to use the emphatic words with which that excellent writer on the picturesque, the late REV. WILLIAM GILPIN, opens his observations on *Forest-Scenery*, “is the grandest

and most beautiful of all the productions of the earth." If this be true when applied to a single tree, what must be said of an assemblage of these noble and beautiful objects, formed to produce a general appearance of composition in landscape, "and to receive the effect of light and shade."

If woods and plantations are to be formed so as to produce handsome and excellent timber, the means employed ought to be equivalent to the end proposed: the author intended, therefore, to add some practical instructions for and observations on planting, shewing the benefit of trenching, manuring, cleaning, and duly preparing the land for the reception of the plants, and as tending to promote the early and perfect development of the vegetable organs. He had another object in view, described in his prospectus—to point out the advantages to be derived from planting forest-trees upon a judicious system, both to individuals, as an investment of capital, and to the public, as affording an extensive field for the employment of agricultural labourers.

It was originally his intention to compose an Essay on this subject himself; but when he

commenced the task, he felt an apprehension that, much as he was interested in planting, and many as his experiments upon it had been, he should, in an age when the progress of science was so rapid, fail to render it as perfect as he desired it might be. He therefore determined to obtain, if possible, the assistance of some one practically engaged in planting, and scientifically qualified to point out the natural progress of the growth of timber, as dependent on soil and situation and judicious management. But he found a great difficulty in carrying this determination into effect, and hence the delay in the publication of the work : but the difficulty has been overcome, and he trusts the Essay on the Planting and Management of Trees, which follows the original communications, will be deemed valuable by all his readers, comprehending as it does all the particulars required by the planter, both in the early and later growth of forest and ornamental trees, in the choice of varieties, the nature of soils, and the diseases, and laws also, to which trees are subject.

This is followed by another Essay on the Pruning of Plantations, by the late MR. JOHN SANDYS of *Holkham*, whose successful manage-

ment, for many years, of the extensive plantations there, belonging to the EARL OF LEICESTER, entitle his opinions to the attentive consideration of every person interested in forest-culture.

Following this Essay, are Remarks upon it by MR. SWIFT, Woodman to the DUKE OF PORTLAND, and some annotations upon that important subject by the DUKE himself.

Subjoined to the whole is an Appendix, comprehending various Notices on the Acacia, either received by the author, or published since his work has been in progress, all of which he is happy to find concur in giving such an account of the qualities of his favorite tree, as justify, in his opinion, every thing that has been said or written in its favour; and he confidently trusts that, ere many years have passed, it will be seen, not only in every ornamental plantation, but also growing in extensive woods, adding beauty to the glowing scenery of our beloved country, and preparing materials for its defence in case of need.

It remains for the Author to acknowledge the patronage bestowed already upon his work. His List of Subscribers presents a Catalogue of

Noble Names, which alone would add dignity and importance to his undertaking ; and to those noble Personages, and the highly respectable Gentlemen whose Names appear in the Prospectus, he begs to offer his most grateful acknowledgments.

Church-House, Holt,
1st June, 1842.

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LETTER
OF
M. FRANÇOIS DE NEUCHATEAU,
ON
THE ROBINIA,
COMMONLY BUT ERRONEOUSLY STYLED THE ACACIA,
OR FALSE ACACIA.

YOU enquire, my friend, what information I have gained, from my own experience and from that of others, relating to the tree which is improperly called *the false acacia*, *the great acacia*, *the tree acacia*, &c. and of which so much is said at the present time.

You have a portion of poor and arid soil, which you nevertheless are desirous to plant, so that it may afford you a speedy return. You are told that this tree alone possesses all the requisites to effect your object, and on this point you request my advice. You are aware that I delight in the elucidation of facts, and in completing whatever I undertake in agricultural

pursuits. I have neglected nothing that could place me in possession of every particular, connected with the subject of your enquiry : my attention to it, in fact, induced me to issue, while I was in office, numerous circulars upon it in connexion with forest-planting ; and it became an object with me to follow up the effect, which those circulars had produced.

It is gratifying to call to recollection, that those letters, written in a stormy time, have caused the cultivation of more than a million of acacias, the very existence of which is the result solely of my exhortations. I should, indeed, have succeeded in causing this tree to be cultivated throughout the whole of France, had the requisite time been afforded ; but it rarely happens, that projects for the public benefit are permitted to effect their object : that, however, which I so strenuously urged while in the administration, I have myself practised in the retirement of private life. During the year 1790, I planted, in the Pays de Vosges, a great number of robinias which I received from Paris ; and these have now, 1802, become fine and handsome trees. Subsequently, having contrary to my wishes quitted my favorite retirement, I no sooner obtained possession of the manor in the neighbourhood of Vincennes, from which I now address you, than I commenced my operations, by planting 12,000 young acacia trees. Every succeeding year, I make fresh sowings and

form new plantations, and am not discouraged by the losses which the present severe weather has caused. You reside in an unpopulous and remote district, where you have neither opportunities of consulting our agricultural authorities, nor of wading through the immense number of volumes, in which their science lies as it were buried. Thus situated, you request my assistance, to enable you to acquire a knowledge of facts, in order to avoid the labor of useless reading, and the disappointment which usually attends the efforts of those who have their experience to purchase. The task you have imposed is by no means so easy as you imagine: there is, however, no dearth of facts or of testimonials. They abound; but, unfortunately, do not accord with one another: but, notwithstanding every obstacle, I shall endeavour to afford you all the satisfactory information in my power; and in order to meet your views, I propose to give a correct idea of the particulars relating to the robinia:

1st, Its name.

2ndly, The horticultural history of this foreign tree.

3rdly, Its qualities and uses.

4thly, The culture that is most suitable to it.

5thly, Prospective views of the purposes to which it may be devoted, and of the important extent to which its cultivation may be carried.

SECTION I.

Of the Name of the Robinia, "Robinier."

IN the first place, it is essential to restore the proper name of this noble tree, which it originally derived from the botanist who raised it from seed, and introduced it into Europe. This was JOHN (not VESPASIEN) ROBIN, one of the professors of *Le Jardin des Plantes*, whence we have subsequently derived so many botanical treasures. It was during the reign of HENRY IV. (*anno* 1600), that this great service was rendered to Europe; and a native of Sweden, LINNÆUS (*Von Linné*), properly decided, that the benefit ought to be commemorated by calling the tree, *Robinia pseudo Aca-cia*.*

* There follows in the original much matter which would be wholly unimportant to the English reader. It refers to the choice of a name suitable to the French language, and digresses to a notice of the private character and habits of J. ROBIN. As a very clever botanist, and celebrated florist, his name has been rendered famous by the following distich, which was applied to him by one of his partial friends:

"Quot tulit Hesperidum, mundi quot fertilis hortus,
Herbarum species, novit hic unus eas."

Robin was doubtless a clever botanist of his day. He does not, however, appear to be more noted for his pre-eminence in horticulture, than for the envious jealousy with which he retained all that he possessed. It is mentioned, that he would prefer to crush the offsets of his flowers under his feet, rather than impart one of them to his friends. *Note by the Translator.*

SECTION II.

History of the Robinia.

You perceive from what I have said above, that the robinia is a stranger to our climates : still it succeeds as well with us, as in its native country, America.

It is curious to trace the vicissitudes to which this tree has been subject, since its introduction into France. At first, every one was eager to multiply it, in consequence of the great rapidity of its growth, the sweet scent of the flowers, and the gracefulness of its foliage ; but this eagerness died away, and people soon became tired of it ; for in this country every thing is governed by fashion, and fashion is capricious. The opinion entertained of the tree in Paris, may be gathered from the following quotation :

“ Formerly, when the acacia was considered a novelty, numbers of it were raised ; but it is no longer the prevailing taste. It was planted in avenues, in groves, in shady walks ; and arbours were formed of it. It grows rapidly, and in spring produces flowers, the odour of which is very agreeable ; but the tree is liable to be injured by winds, and as its bark is rough, and the leaves small, it is no longer in request for orna-

mental plantations: here and there, however, one may still be seen in a garden, which the proprietor has thought proper to leave standing. The tree is headed down from time to time, by which operation it becomes deformed. Now the acacia is only tolerated in court-yards, and that solely because of the grateful scent of its blossoms.”*

PLUCHE, the author of that truly estimable work, *Le Spectacle de la Nature*, contents himself by making one of the personages of his dialogues speak in praise of the sweet odour of the acacia. This is all the notice he takes of the tree.

The author of the *Manual of Botany*, in an article on ornamental trees appropriate to gardens, mentions the robinia in the following terms:† “It is a handsome tree, which grows rapidly, and towards the end of May, becomes loaded with clusters of milk-white flowers, of a very agreeable scent. It may be formed into noble groves. Our ancestors used to plant the tree in their court-yards, and sup under its shade, as the Romans formerly did under that of the plane tree.”

After having been an object of too great attention among us, on account of its agreeable

* *Dictionnaire Pratique du Bon Ménagier, par Liger, en 4to, tom. 1.*

† *Manuel de Botanique, quatrième partie, p. 73.*

properties, it fell into neglect because it appeared a matter of doubt, whether a renumerating return could be derived from it. Within the last fifty years, however, the acacia has become better known; and is found to possess so many valuable properties, that it now deservedly ranks among the most useful of our timber-trees.

DU HAMEL DE MONCEAU, who gave the first stimulus to the progress of agriculture in the reign of LOUIS XV., began, as early as the year 1755, to do full justice to the merits of the robinia. He devoted an article to it in the treatise that he published in that year, upon trees and shrubs which might be grown in the open ground (2 vol. in 4to); and this article laid the foundation for all that has since been written on the subject. No writer can go deeply into any enquiry respecting forest-tree culture, without consulting DU HAMEL.

In 1759, public attention was again roused, by an account of a discovery which was transmitted to M. DE JUSSIEU by a learned German. This person had made a successful attempt to feed cattle with the leaves of the acacia; and having succeeded, he spoke in high terms of this new and excellent species of fodder. The notice, that M. DE JUSSIEU in consequence hastened to make public, will be found among the select articles, appended to this letter, No. 1.

In 1762, a small pamphlet of forty pages was published at *Bordeaux*, entitled, "A new Treatise upon the Tree, named Acacia." This was inserted in the last volume of the *Gentleman Cultivator* (*Gentlehomme Cultivateur*), and is a panegyric on the robinia, giving a detailed account of its useful properties. It will be seen in select articles, No. 2.

In 1772, the Supplement to the *Encyclopædia* of Paris contained many excellent papers upon botany and gardening, from the pen of M. DE TSCHUDY. That upon the acacia is by no means the least interesting. He was passionately fond of trees, and wrote *con amore* on the subject.*

In 1781, M. MUSTEL published his *Theoretic and Practical Treatise on Vegetation*, which contained an account of many new experiments upon the economy and cultivation of vegetables (4 vol. 8vo.), in which he rescues the character

* This article, unfortunately, was not added to the select pieces, for a reason which applies to France only; namely, the alleged wide dissemination of the *Encyclopædia*. This work is by no means general in England, and there are, it is probable, but a very few copies of it in the possession of collectors. Hence we have no means of ascertaining the facts afforded by these articles of M. DE TSCHUDY above referred to. This is to be regretted, as whatsoever he wrote could not be otherwise than estimable. He translated Miller's *Gardener's Dictionary*. His name, by some, is spelt, TSCHOUDI (JEAN-BAPTISTE-LOUIS-THEODORE). He died in 1784.—*Translator*. This article will be procured if possible, and translated for this work.

of the acacia from the injury which it suffered, solely through the negligence of those who had cultivated it. He maintains that the tree, which grows with rapidity even in indifferent soils, combines almost every desirable quality, constituting the agreeable and the useful.

M. MUSTEL places the acacia between the horse-chestnut, and the lime tree, and greatly prefers it to the latter. This treatise of vegetation forms a valuable system of vegetable physiology; but, being the work of a Frenchman, we affect to forget it, and give the preference to the translations of foreigners.*

After the author of the *Nouveau Traité*, and M. DE TSCHUDY, had written in praise of the robinia, an American colonist presented a memorial to the Agricultural Society of Paris, in which he greatly surpassed those writers in the eulogies he bestowed on the tree. This interesting little work merits perusal: it will be found in select articles, No. 3.

* A variety of observations succeed, wholly useless to the English reader: I have thought right, therefore, to omit them in the translation. An authority, however, is referred to, which may interest those who possess the French Encyclopædia: it is that of the Abbé ROZIER, who wrote an article, entitled Acacia. ROZIER, it appears, saw in the Garden of Plants the original parent-tree, raised by JEAN ROBIN, from which all the Acacias at that time growing in Europe had been produced.—*Translator*.

In the following year, 1787, MR. ARTHUR YOUNG commenced his Agricultural Tour in France, which you possess. There are some inaccuracies in the work, but, imperfect as it undoubtedly is, it remains a remarkable memorial of the state of agriculture in France before the revolution. Mr. ARTHUR YOUNG, in passing through Orleans, particularly noticed the superb robinias which grow in that city.* Indeed it appears, that this tree is to be seen in its highest state of perfection, in the city of Orleans and its environs. It is planted before the doors of all the houses. Why should not this custom prevail every where?

In 1789, the French Gardener's Dictionary, (*Dictionnaire du Jardinier Français*) was published by M. TILASSIER: the work is not completed, but it contains several good articles. It is supposed that the author availed himself of the MSS., or of the verbal instructions of M. DE MALESHERBES. The articles on the robinia are well digested, and I think it right to add them to the other select articles.—*See No. 4.*

In February, 1793, (30e Pluvoise, an 2), the National Convention decreed, that an im-

* On the 30th May, 1787, at Orleans, I admired the handsome acacias which are planted in that city.—*Voyage en France, tom. 1, p. 50.—Original note.*

pression of the Cultivator's Year-Book, *L'Annuaire du Cultivateur*, should be struck off, and distributed in the departments. This work the Committee of Public Instruction thought worthy of a place among other elementary books, intended for the use of national schools. It is curious, on account of the epoch of its publication, of its singular construction, of its important object, and of its extravagant (*bizarre*) style. This strange production was a solemn act, which barbarism paid to nature, to reason, and to industry. Every day of the year was noted by one or more natural productions, or their attendant phenomena: the sixth of May (14e *Prairial*) was consecrated to the robinia by the following notice:

“ACACIA (*false*), a large spiny tree, a native of N. America. It grows rapidly; its foliage is very graceful, and casts a light shade; its flowers are white and very odoriferous, and a useful syrup is made from them; the young shoots are good for cattle; the root is tender and saccharine, having the scent and flavor of stick liquorice; the wood is veined and hard, it splits readily, and does not decay when exposed to the action of either air or water. It is used for hop-poles, vine-props, hoops, mill-work, and other machinery. In America, it is preferred for the stern-posts and knees of vessels. If kept low, and grown as the osier is, it would, even in poor soils, furnish frequent cuttings. A

variety without thorns, *Robinia inermis*, is a low growing tree."

It is scarcely correct to say, that the blossoms of the robinia are *very odoriferous*; but allowing for some overcolouring, it must be confessed, that the few lines above quoted contain whatever may be justly said in praise of the tree.

One of the singularities that characterise our revolution is, that the philosophical idea of the Year-Book, *Annuaire*, should have been conceived and executed during a period of the most tremendous convulsions. No other nation can produce records of this description : the English revolution produced nothing that can be compared with it. Notwithstanding all its defects, the republican *Annuaire* will go down to posterity. Although we blame the excesses of the Convention, we must be just to it.

Soon after this time, M. DETTMAR BASSE published an interesting pamphlet, Upon the Utility of the Acacia Robinia. (*See select articles*, No. 5). This little work attracted the attention of the Agricultural Society of Versailles. M. CHALLAN gave in a report concerning it, and the society soon afterwards offered a premium for the culture of the acacia. Their report and programme are worthy of publicity. *See select articles*, No. 6.

M. MULLER has corroborated the remarks of M. DETTMAR BASSE.—*See idem*, No. 7.

Finally, an article upon robinias is to be found in an English work, published in 1796, on the Art of forming Ornamental Gardens.—*See select articles*, No. 8.

The opinions dispersed through these various treatises deserve to be collected together. They concur in presenting a very advantageous view of the tree under consideration, and may prove useful to a person who, like yourself, is tempted to cultivate a plant which combines so many agreeable and useful qualities. For general culture I should myself give the preference to fruit-bearing indigenous trees; but there are poor and unproductive soils, in which such trees will not prosper: it is fortunate, therefore, that we possess an exotic which will supply their place, gradually adapt itself to inferior soils, and speedily produce a profitable return. In this point of view, the robinia merits much of the praise so prodigally bestowed upon it by some of the authors above referred to. Their praises are excessive, and must doubtless be qualified: still, to adhere to the simple truth is to confess, that the tree is deserving of every attention; and this fact is worthy to be commemorated, respecting the most admirable of the plants that have come to us from America. It may serve in a degree to indemnify Europe for the bitter

consequences, which followed the great discovery of that country.*

The ancients make no mention of the robinia, because they were not acquainted with it. It is to be regretted that Horace had not breathed the perfume of its flowers : he would doubtless have addressed it in some charming lines.

SECTION III.

Of the Qualities and Uses of the Acacia.

It is not needful here to enter at large upon the botanical details of the tree. You know that the robinia belongs to the leguminous tribe of plants ; and from the works of JUSSIEU, and his able successors, you have learnt all that relates to its general character. I shall, therefore, confine myself to those more immediate peculiarities which may point out the value of the tree ; and as every part of it possesses some

* The bitter consequences (*des fruits d'ailleurs amers*) must refer to the scourge of the American war, a war which involved, in the first instance, America and the mother-country, and subsequently France, Spain, and Holland. There is little doubt that this war indirectly led to the revolution in France, which broke forth in less than five years after the peace of 1783.—*Translator.*

known good qualities, we are naturally led to suppose that there may be others not yet discovered. We will now proceed successively to examine its leaves, flowers, seed, and wood.

Of the Leaves.

The form of the leaves is very graceful: they are conjugate, and composed of leaflets which are soft to the touch, of a lively green, and possessing the singular property of being unattractive to any insect. When the tree is planted in a situation that is favorable to its growth, it assumes an elegant tufted appearance, admitting the rays of light, which break playfully through its open branches. The robinia is liable to be injured by the frosts of spring; but it possesses the exclusive power to replace the perished shoots, by a second or even a third series of buds. Occasionally the tree is trained against a trellis, so situated that its foliage shall produce a pleasing effect of light and shade: the latter becomes more dense as the warm season advances, whereas the foliage of all other trees suffers and droops, when long exposed to the influence of the sun's rays.

The acacia bears pruning well. When its leaves have been cut for the use of cattle, others quickly succeed them. They may be gathered twice in one season. All animals eat them with avidity. The young spines form no objection to

the leaves as fodder. Furze is equally furnished with sharp prickles; it is nevertheless bruised for the same purpose. However, it would be advisable to avoid giving the woody branches, which might prove injurious. The leaves are cut with a long-handled hook, made for the express purpose.

I shall recur to this subject in the course of my letter, and also in the notes, which I shall add to each of the select articles at its close.

The late M. DOMBOURNEY was induced to believe, that he could obtain from the leaves, by means of maceration and fermentation, products similar to anil and indigo; but he failed in his experiments. He was led to make the attempt, in consequence of knowing that the tree is classed with plants possessing leguminous flowers. He recommended those who are curious in the art of dying, to commence a course of experiments upon trees and plants of this family.

Of the Flowers.

The robinia produces numerous clusters of milk-white flowers, the odour of which is diffused to a considerable distance. It sometimes comes into blossom during the first year after it is planted. The scent is not unlike that of the orange-flower. An arbour of robinias would be

sufficient to perfume a large garden. The flowers are, however, very fugacious, lasting only about eight days; but they do not lose their perfume, which may be communicated to pomades, liqueurs, and syrups. I never drank any thing to be compared with a liqueur, which is distilled from them in St. Domingo.

In a province of the south of France, an attempt has been made to extract a yellow dye from the flowers, in consequence of a known practice of the Chinese. The blossoms should be gathered before they become too fully expanded. The stamens and petals only are made use of: these are put into a brass vessel and placed over a furnace, a clear fire is to be kept up, and the flowers stirred continually and quickly. When they have assumed a yellowish tint, six large spoonsful of water must be added: the boiling is then to continue, till the whole become a thickish mass, and the colour a full yellow. It is then to be placed on a drainer of stout cloth, and the more fluid portion to be pressed through. Four ounces of alum to every pound of flowers are then added, to produce a rich yellow; and this quantity will be sufficient to dye six ells of stuff, ell wide. To obtain a paler colour, only three ounces of alum are used, to which is added the powder of well-calcined oyster-shells. A golden colour is given to the stuff, by dipping it twice in the bright yellow

dye, in which, before the second immersion, a small quantity of brazil wood had been infused.

Recently gathered flowers always give the best colour : they will however keep well dry, and will be serviceable, even after being stove-dried : they only, in the latter case, require longer boiling. Extracted from a work, called *L'Agronomie et l'Industrie*, tome 2, à Paris, 1761.

Of the Seeds.

In China it is usual, at the beginning of winter, to put the seeds into a vessel, and barely cover them with ox-gall. It is supposed that the seeds, thus prepared, and gradually dried in the shade for about three months, *cent jours*, are a remedy for internal hemorrhages, clearing the eye-sight, and preventing the hair from turning colour. Extracted from a Chinese work, in *Les Lettres Edifiantes*, tome 24, 1736. Between ourselves, the best use that has hitherto been made of the seeds of the robinia is to sow them (in the manner I intend to recommend to you), to perpetuate their species.

The author of *Mémoire sur les Hayes*, who was crowned by the Academy of Lyons in 1784, places the robinia among thorny plants suitable for making hedges ; but he states, that the flow-

ers of this tree seldom ripen their seeds in this climate, and that those which occasionally appear to be perfected will not germinate. This author wrote at Montpellier.

Another author and agriculturist says, he has remarked, that seeds which are produced on single or solitary trees are almost invariably barren; but it should be observed, that these useless seeds are borne by trees which have been raised from suckers: those in the vicinity of Orleans are almost all of this description; but when they have been raised by sowing, they never fail to ripen perfect seed.

M. VILMORIN ANDRIEUX every year sows many thousand seeds, the collected produce of his own gardens, and they rarely fail to afford very handsome plants. The late spring-frost of this very singular year, 1802, has destroyed more than 60,000 of his young trees. You may be supplied by him most advantageously with plants and seeds, and cannot be better served: he is an honest tradesman, an accomplished botanist, and a man of ability, well calculated to give the best advice to cultivators;*

* The foregoing observations would be somewhat out of date, and uninteresting to the English reader, were it not for the fact, that the name of VILMORIN still exists, and few men are more respected or celebrated than M. VILMORIN of the present day.—*Translator.*

Of the Bark.

The bark, as well as the roots of the tree under consideration, abound in saccharine qualities ; but they have not been sufficiently investigated to establish the fact, that the root of the robinia possesses medicinal virtues, similar to those of the liquorice-plant which it much resembles : it has, however, been occasionally employed in diet-drinks.

Of the Wood.

The wood of the robinia, is the part which constitutes its chief value. No tree forms a greater quantity, and there are few woods that can be employed for so many useful purposes. I shall proceed to notice some of them :

- 1st, As fire-wood ;
- 2ndly, As timber for building ;
- 3rdly, As wood for the dyer.

The Director of the Economical Society of Bavaria speaks in high terms of the usefulness of the robinia, for forming hedges, and for a variety of purposes ; but asserts that it is *not* valuable as fire-wood.

M. MEDICUS, Director of the Botanical Garden at Manheim, on the contrary, is of the op-

posite opinion. In a memorial to the Electoral Society of the Palatine of Heidelberg, upon the most eligible Trees for the rapid production of Fire-Wood, he proposes to introduce *this* tree into the forests of that country, for the very reason, that the chief advantage to be derived from its culture will be the excellent fire-wood which it yields. He equally recommends the *gleditschia*, *G. triacanthos*, *three-thorned acacia*, which succeeds perfectly in woods.

M. POEDERLL saw it thus planted, in 1769, by M. M. DU HAMEL, who gave him some of the seeds; but this triply-thorned, leguminous tree, is less rural in its character, and when young is more delicate, than the pseudo acacia. With respect to the quality of the tree as fire-wood, M. MEDICUS is correct, for the robinia is undoubtedly one of the best combustibles in the whole of the vegetable kingdom; and very correct information upon this subject will be found, in some of the articles which are annexed to my letter.

As the acacia advances rapidly, even in a light sandy soil, with a northern exposure, I am not aware that a better means can be found of turning such a soil to good account, than by there planting this tree, which, in consequence of its rapid growth, produces fresh wood just in proportion to its destruction. Although this advantage may have been heretofore unnoticed by

the *great*, it ought to have weight with private individuals, who are anxious to fulfil their duties as fathers of families.

Of the Wood, as serviceable Timber.

It is said by some of the writers, whose articles will appear hereafter, that the French people, until now, have known the robinia merely as an ornamental tree; but this is not the case. Many years have elapsed, since it was first grown in some of our forests: in proof of this, the works of the illustrious DU HAMEL may be consulted, and the Treatise upon Woods (in 2 vol. 12mo, 1769), an extract from those works. Numerous details are therein given, respecting the soil best suited to the tree; the inconvenience resulting from its tendency to produce abundance of suckers, which, although it has caused its banishment from the garden, renders it extremely profitable to the forester; its use as fire-wood, and for making charcoal; and its applicability to the purposes of the sawyer and turner. Also, that, as a pollard, it produces good poles, vine-props, hoops, and handsome grained wood for furniture. These details, it appears to me, afford satisfactory evidence, that the French have not waited for the example of other nations, but have long appreciated the merits of the robinia as a forest-tree.

In the Supplement to the Encyclopædia,

M. DE TSCHUDY, expresses himself very clearly upon this subject. He observes, that the wood is very hard, of a beautiful grain, and takes a fine polish: the colour is yellow, veined and waved with two or three shades of olive, handsome pieces of furniture being made of it. The wood is in request among turners; and it might be more extensively and profitably used, were it so cultivated as to allow it to attain its natural dimensions.

DU HAMEL DE MONCEAU, in his Treatise on the Improvement of Woods, informs us, that he has seen large vats that were made of acacia, as well as of white mulberry. *Traité de l'Exploitation des Bois*, tom. 2, 4to, p. 571.

VARENNE DE FENILHE, in his work on the comparative value of indigenous and naturalized trees, decides that the robinia, on account of its general utility, is one of the best that has ever been imported from North America into Europe. His observations led him to conclude that the wood, in its green state, possesses, bulk for bulk, more ligneous qualities and less sap than any other tree. A cubic foot, according to him, weighs fifty-eight pounds eleven ounces; and a cubic foot of the dry wood lost in weight only about three pounds.* He correctly observes;

* These weights require some correction, in order to make them agree with those of this country. — The old Paris pound weighed 561 grains troy

that one of the most important circumstances in the different kinds of wood is, the bulk that they lose in drying. The robinia enlarges much more rapidly than the oak, yet its wood is incomparably more dense. This rapid enlargement is almost miraculous (*Ce grossissement du robinier tient du prodige*).

M. DE TSCHUDY states, that he saw two robinias, in a court-yard at Metz, which were fifteen metres in height, and half a metre in diameter.* They were growing vigorously at the time of their being cut down, and appeared still to be far from having attained that period, when trees cease to enlarge, and merely keep up their size and appearance.

The author of the work entitled *Le Manuel de l'Arboriste* and *Le Forestier Belgique* says, that the acacia is in request for the staves of large casks and vats: he adds, that the tree will always be valuable if grown for utility, and not merely for ornament.

In the park of Enghien some robinias were raised from seed, which, in the course of three

more than the English avoirdupois of 7,000 grains: hence, about one twelfth must be added to a cubic foot of the wood above mentioned.—*Translator*.

* As the metre is 39,37100 inches in length, fifteen metres amount to about sixteen yards, one foot, two inches.—*Translator*.

years and a half, had attained the height of twenty-five feet, and were nine inches and a half in girth. It is evident, that these trees must have been grown in very favourable soil : at the same time it should be observed, that the acacia pushes very rapidly in the early stages of its growth, producing branches of two metres (above six feet, six inches) in length, at one flowing of the sap. At Rochette near Melun, I measured some of these trees in the fine nursery of M. M. MOREAU, which had grown three metres (nine feet, ten inches) in one year. This growth is extraordinary, is astonishing, in a tree which the natives of Louisiana style, *par excellence*, the hard-wood tree.

Wood used for dying.

There is an excellent work by the late M. DUBOURNEY, a tradesman of Rouen, containing an account of a collection of experiments upon the fixed dyes, that may be given by plants of indigenous growth to worsted and woollen goods ; and he ascertained, after a series of trials, that the wood of the robinia might be used with great advantage by the dyer. Two ounces of the dry matured wood, cut into small pieces, and digested for two hours in a pint of water, communicated a rich bright yellow (*jaune rayonnant brillant*) to a drachm (*gros*) of dressed wool. If the infusion be made very strong, that is to say, if four or five ounces of

wood be employed, and the wool be boiled in it for four or five hours, it acquires a deep golden brown tint (*musc doré*). The shades may be varied at pleasure, by increasing or diminishing the quantity of wood, and the duration of boiling.

The young wood, used green, forms a bath or vat, the odour of which greatly resembles that of liquorice-root. This dye produces a lemon-yellow, more or less deep in proportion to the quantity of the ingredient used, and the time employed in the preparation of the vat. The wood retains its dyeing quality for a very long period. In three quarters of a pint of water, M. DUBOURNEY digested six gros* of old wood, that had been cut eighteen months: the vat assumed a yellowish fawn colour; and fresh wool, combed and once washed, after having been boiled in the dye for four hours, contracted a rich and brilliant fawn colour (*carmélite fauve*). These various facts prove, according to M. DUBOURNEY, that the colouring matter of the wood does not deteriorate by age.

The Cultivation of the Robinia.

The tree possesses so many valuable properties, that it becomes an object of interest to cul-

* A gros is not quite equivalent to a drachm. It weighs 59,0703 troy grains.—*Translator.*

tivate it extensively, and turn it to every possible advantage. It may be increased by two methods—sowing the seeds, and taking offsets from rooted plants. The first is seldom adopted by private individuals, which is erroneous : for people imagine that the process is not only tedious, but uncertain, and that much time is gained by purchasing plants ; and the consequence is, that few, excepting nursery-men, raise plants from seeds.

It is advisable, however, that cultivators, who reside at a distance from nurseries, and can more conveniently procure seeds than plants, should be made acquainted with the best method to make them germinate. Some authors merely direct, that the seeds should be collected in October (*Brumaire*), when the weather is dry ; that they be taken from the pods in February (*Ventôse*) ; and that then a shady situation should be selected, and a good bed prepared, by mixing the soil with sand or dry vegetable mould, in which the seeds are to be sown at a trifling depth : that the bed be then watered, and covered sufficiently to protect the rising plants from the attacks of birds, who destroy them by nipping off the seed-leaves.

The following directions are more comprehensive, and detail a method which I have successfully pursued. The pods are to be collected when perfectly ripe ; and the seeds, being taken

out, are to be exposed to the sun. They are then to be kept in a dry place during winter ; and, in the spring, they are to be soaked, and then sown in a bed of light earth, which is afterwards to be raked smooth. Three seeds should be placed in holes made with the finger, taking great care not to break off the sprouting germs. The holes are to be about three feet apart, in straight lines ; and when the seeds are sown, the holes are to be filled with earth.* Hemp may be sown in the spaces between the lines, but the plants are to be drawn up if they threaten to choke the acacias. Should all the seeds succeed, they should be thinned out, and those that remain secured by small stakes, placed along the rows.

In the following year, the intermediate spaces should be well digged and prepared, when hemp may be again sown and raked in, care being taken that the young trees be not injured by the operation. The same routine of digging, &c. is to be repeated twice ; first in the

* The author subsequently directs, that three seeds are to be sown in one hole, but he does not state the depth ; and as all writers agree in directing very shallow sowing (not much exceeding a quarter of an inch below the surface), there is no doubt that holes scarcely deeper are intended. I incline to think, moreover, that as each seed, in consequence of the previous soaking, is supposed to be in a growing state, it would be advisable to drop *one only* into each hole ; but that three holes, in the form of a triangle, perhaps three inches apart, should be prepared for the three seeds.—*Translator.*

winter, and then in the succeeding spring, sowing the intervals with turnips or peas. The robinias, now become shrubs, are to be transplanted in February or March, when there is no frost; and the future culture is to be attended to, conformably with the directions in the select articles at the end of this letter.

The method I have laid down is good, although it may be somewhat complicated: I shall, however, by adducing a variety of experiments, attempt to simplify it, and you will find ample directions for raising the trees in the articles above alluded to. These directions may be compared with one another, and that mode selected which shall appear the most feasible, or new ones may be attempted. One great advantage which attends the culture of this tree is, that it may be removed with safety, at almost any age or size. I once wished to form an avenue of trees upon an extensive terrace as speedily as possible: I therefore procured plants at La Rochette, a very celebrated nursery near Melun, which were fifteen or sixteen feet in height. Almost all succeeded: indeed, several of them came into bloom the following year and bore seeds, although they had suffered severely from the late frosts in the spring, and the subsequent drought of the summer. There are, nevertheless, some requisite precautions to be attended to in order to secure the success of the tree. Though the robinia grows fast and tall, it does

not send its roots deep into the soil : on the contrary they apparently creep, or rather extend laterally, along the surface of the ground : on this account the trees, if planted singly, must be sheltered, or they will be unable to withstand the force of the westerly winds ; and yet they never do well if they are *planted deep*. The aspect too is of importance, for if the tree be exposed to the south or west it often perishes : a north or eastern aspect suits it best. Notwithstanding my success in the removal of large and well established trees, I believe that it is always advisable to transplant when young ; for then they adapt themselves to the soil, grow more rapidly, and in short the success is more certain. It is still better to sow the seeds than to transplant : the practice of raising plants from seeds is more in conformity with nature, and it is beneficial, when practicable, to follow her dictates.

The most favorable season for forming plantations of young trees is, from the middle of March to the end of April. M. DE TSCHUDY lost numbers of trees by having removed them during winter. He found, that those plants which survived the winter, after being planted out in the autumn, never sprouted so early as those which we plant in the early spring-months ; and my own experience confirms this important fact.

The roots of the robinia, it has been stated, extend to a great distance: hence the trees should be set a considerable distance asunder. In the public nurseries, the seeds are sown closely, in order to save ground; and the consequence is, that the roots intertwine and become fastened together. It is therefore desirable, that every planter should form his own nursery, and sow the seeds of all those trees which are intended for transplantation at about three feet apart, as I have before directed; but, to obtain the tree in perfection, the seeds should be sown on the spots where they are intended to remain.

In some situations the plant will not grow freely. If the fault be in the soil, it must be ameliorated by digging in well decayed manure about the roots; and adding mulch, *plâtre*,* on the surface, round the stems.

On the Uses of the Robinia.

I come now to consider the method of extending the cultivation of this tree, which ought to be better known and valued than it is. If the plants be raised from seed, which is always to be preferred, it is probable that several

* I think it best thus to translate the word *plâtre*, which literally, however, means plaster of Paris (gypsum, sulphate of lime), though this mineral manure might be a very valuable addition, as it is found useful to trefoils, and other herbaceous plants of *leguminosæ*.—*Translator*.

varieties may be procured. M. LEZERMÉ remarks, that in this way a spineless robinia, *robinia inermis*, has been produced. This is an advantage, as it appears that it could only be obtained by grafting or by layers. It is desirable to propagate this variety as much as possible, when the object is to fodder cattle with the leaves. A low coppice of it would form one of the richest artificial meadows imaginable; for the more frequently it is cut, the greater would be the supply for many years. It would become a kind of perpetual tree-trefoil; and there is no doubt, that the ground would be thus prepared for the production of every species of field-crop, after being properly cleared from the roots of the trees by grubbing and digging.

Seedling robinias require a little shelter in the early stages of their growth: in the winter they should be covered over. It might, perhaps, prove advantageous, to sow some biennial crop among them, to be a defence from the extreme cold of that season. Presuming that the seeds have been sown in the autumn, in the manner before directed, and that *three seeds* have been dropped into each hole, what objection could there be to sow a crop of rye with the acacias? This might be cut green in the spring of the following year, and again, more than once, during the summer, before it comes into ear, which process might be retarded until the second year. I have recommended this method,

and it has been tried, but I have not heard the results; and as I do not reside in the country during the winter, I have been unable to superintend the progress of the experiment. This seed-sowing might be performed in various ways, but care must be taken always to sow the spaces between the rows of trees, in drills or furrows marked by the line, so that the different hoeings may be performed without wounding or tearing up the young plants. An erroneous opinion has prevailed, that the acacia should always be planted distinct from other trees: it will be shown hereafter that it succeeds well in company with the oak, and this fortunate circumstance should never be overlooked.

The seed will vegetate after having been kept a twelvemonth; but when eighteen months or two years old, it is recommended to steep it for twelve or twenty-four hours, in the liquid that drains from a manure-heap.* It is probable that liming the seeds would be found of use; and I am of opinion that plaster of Paris might be as beneficial to the seeds of the robinia, as when applied to others of the leguminous tribe, which, particularly clovers, as I shall hereafter show, derive the greatest benefit from plaster of Paris, or gypsum, in a merely crude state, reduced to powder.

* The process and effects of steeping, in various liquids, will be examined in a special article.—*Translator.*

The quantity of seed to be sown, and the final situation of the plants, must depend upon the extent and quality of the land to be planted. If the former be very considerable, woods may be made. It must be remembered, that the poorer land will yield an abundant return, and at the same time its quality will become ameliorated. I have long proposed, that the culture of trees should enter into the order of the rotation of crops. This has never yet been attempted by agriculturists, who have been satisfied to make the cereal, leguminous, and grass crops alternate with one another. The robinia might very eligibly be introduced into succession, in consequence of the rapidity of its growth. The experiment of low coppices for fodder remains to be fairly tried, and a considerable time must necessarily elapse before its success can be established ; because the coppices should show signs of exhaustion, before they be exterminated. This requires a longer or shorter period, but the final success appears to me to be infallible.

Whoever plants the acacia with a view to a speedy return, ought at the same time to provide for his posterity, by planting trees of slower growth in their vicinity. Thus, at Morfontaine, young oaks are rising under the shade of a noble avenue of acacias. The oak and the robinia ought always to be companions, because the roots of the former tap, or go perpendicu-

larly into the earth, whereas those of the latter ramify, in a horizontal direction, just below the surface, so that they neither injure nor interfere with each other. The robinia will soon remunerate the planter ; and if an oak be grown near it, the former, a perishable tree, will be replaced by one that will go down to posterity.

However small the extent of land intended for planting, robinias will be found the most advantageous crop. Every plantation requires enclosures. Without fences, crops, and trees in particular, cannot be protected ; and, for this purpose, nothing is so available as the plant under consideration. It only requires experience to set about the work. A hedge may be formed by planting the young trees in lines ; or, as is the practice in one or two countries, by sowing the seeds where a hedge is to be made. The latter is the mode adopted in Bavaria, as appears by the following account, on the authority of the Director of the Electoral Economic Society of that country. These are the particulars:—Towards the end of April, an open drill, three inches wide and one deep, is made where the hedge is intended to stand. In this drill, the seeds are sown, at the distance of two or three inches asunder, and then lightly covered with earth. The plants attain the height of a foot during the first year ; but, in the second and third, they become a handsome size, stout and spreading. It is only during the first year

that they require any protection, by being covered with straw or leaves : subsequently no precaution need be taken. The trees are not suffered to grow above twelve feet in height, before they are headed down, in order to give them strength and thickness : they are thus enabled to resist the force of the wind ; and, though the roots extend to a great distance superficially, it is not supposed that they injure other plants that are near them. This doubtless applies to trees with tap-roots. The acacia abounds with very sharp and strong thorns, so that a hedge formed of it becomes impervious even to a bird (*que le plus petit oiseau ne peut se glisser au travers*). The Director concludes his remarks by saying, that this species of hedge is the handsomest and best that can be made.*—*Gazette d'Agriculture*, 1772.

The Director is not the only one who has had an idea of planting acacia hedges ; but of all who have written on the subject, no one has given such explicit directions as M. DUMONT COURSET, in the Botanical Cultivator (*Botaniste Cultivateur*). After having traced the plan of a garden surrounded by walls for trained fruit-

* It will appear in the course of this work, that opinions vary on the subject of acacia hedges. Individually speaking, I incline to think, that it is not the plant most applicable to the construction of hedges. Its branches are large and brittle, and do not appear to throw out the requisite number of shoots, to form a compact fence close to the ground. The plan has I believe failed in England.—*Translator*.

trees, he thus describes the formation of hedges, for external defence :

“ A hedge of white-thorn is, in the first instance, to be planted in a straight line along the exterior side of the wall. The plants are to be crossed and plashed as much as possible, to render the hedge compact throughout; and they are not to be suffered to exceed three feet in height. A ditch is then to be dug, three feet beyond this hedge, the banks of which are to form a slope of three feet also in depth. Its breadth is to be five feet at the bottom, and six at the top. Along the bottom of this ditch young acacias are to be planted, three feet apart (not in holes, but on the level of the *floor*), and the roots covered with eight inches of surface-soil that had been thrown out of the ditch. As the trees grow, the branches are to be interlaced, and stopped at the height of the white-thorn hedge. When the trees have become strong, every alternate tree is to be cut down to the ground, to cause the production of young shoots. Three feet on the outside of the ditch, a second hedge of white-thorn is to be raised, and treated as the first described above. This is also to be headed down at the same height, three feet, and must be protected from cattle, during its growth, by a rail-fence or dead-hedge. A defence thus constructed is impenetrable, particularly if care be taken not to leave

any gaps between the stems and branches of the acacias. No one would venture to force an entry through such a barrier, secured as it must be by the impassable thorns of the robinia. It would be found sufficient in any case of enclosure whatever. It is of consequence that the acacias be planted at the bottom of the ditch, in order to obviate the inconvenience that would arise from the roots of the trees, if they were to be placed on a level with the cultivated ground. These roots are numerous, and ramify to a great extent, producing a multitude of suckers ; but the trees being planted three feet below the soil of the garden, they can produce no injurious effects."

The author cites the following remarkable example, to prove the tendency of these trees to throw up suckers. Two large acacias grew in a court-yard near his residence ; and, to his surprise, he one year saw a number of suckers springing up in his garden, where no tree of the kind had been planted. A wandering root had passed under the wall, attracted by the rich soil of the garden ; and although the trees in the court-yard were soon after cut down, and their roots grubbed up, these troublesome suckers still continued to intrude in the garden, long after the destruction of the parent-trees.

This tendency of the acacia to throw up suck-

ers, augments its value materially, provided it be planted where the young trees can be rendered available.*

The excursive habits of its roots may be turned to great advantage, for the earth is compressed by them, held firmly in its place, and effectually prevented from crumbling away: hence it ought to be used for the protection of embankments, as well as for the glacis of fortifications. This is the opinion of M. DUMONT COURSET, in his meritorious work, *Le Botaniste Cultivateur*.

It has already been stated, that if this tree be planted as coppice, it will furnish very fine young wood, and speedily bring a remunerating return; but it must be added, that a young wood cannot be cleared without great caution, and a peculiar set of tools, adapted to the express purpose of cutting it, will be required. Wood-cutters are particularly averse to this work, on account of the long and dangerous thorns with which its numerous branches are armed. Common gloves are useless. The men must be provided with a sort of gauntlet, and with very sharp instruments. On these accounts, it is desirable that the *robinia inermis* should be cultivated, by

* Here follows a long digression upon matters purely local, and irrelevant to the English reader. Much repetition also exists: I have therefore thought it right to omit, in the translation, all that occurs between the 68th and 79th pages of M. DE NEUCHATEAU's Letter.—*Translator*.

layers or by grafting. As a tall standard, the robinia is superior to the oak. There is ten times the bulk of timber in the former than there is in the latter, of the same age, *i. e.* twenty years; and a robinia of thirty years' growth will yield timber of nearly twenty inches square (*demi-mètre*): whereas an oak of that age would be a mere sapling, measuring scarcely four inches square (*deci-mètre*). It remains to detail a number of important experiments, to determine the valuable properties of the tree, and the purposes for which it may be employed.

Trials should be made to sow the seeds in lines, and to plant carefully with the view to refurnish the glades and vacancies of woods and forests. These sowings ought to be made several years before a contemplated fall of timber is to take place. In order to encourage the cultivation of so important a tree, prizes ought to be previously guaranteed,

1st, To those who may have established a public nursery of robinias, and other trees which can be advantageously cultivated in poor soils,

2ndly, To those who, from a stated time, shall have provided a certain quantity of billets of this tree, for fire-wood for our great towns.

3rdly, To those who shall, from the same

stated time, be prepared to furnish a stipulated number of vine-props, for the use of the vineyards.

4thly, To those who, within a given period, shall supply the navy with timber suitable for ship-building, and the artillery with wood proper for gun-carriages.

5thly, and finally, To those who, in the like time, shall produce a number of useful and ornamental pieces of furniture, made of acacia, or the wood of other naturalized and indigenous trees.

All this might be accomplished, if the public understood its own interests, and the duty it owes to posterity. An undue attention, certainly, ought not to be given to the exclusive cultivation of one kind of tree: a diversity of soil and situation require the propagation of trees applicable to each, and such we fortunately possess. A system of prizes well managed, aided by national measures, would quickly repair the evils, resulting from a constant and progressive demolition of the woods and forests.

Adieu, my dear friend. May you be happy in your pursuits. Sow, plant, and graft robinias in abundance, not only for your own purposes, but to distribute among your neighbours.

In order, however, to perfect your scheme of improvement, form and adhere to a plan of operations: first to enclose, next to clear, then to prepare the ground, and last to plant in succession the several portions of your estate, which are suitable to that kind of cultivation. Divide the work with judgment: let so much be done in each year, to equalize the expense. Begin by forming a nursery, that you may have all your resources at hand: keep an exact account of your undertaking, and compare the expense of every operation with the amount of its return. This register of expenses is unfortunately too much neglected; but it is essentially necessary to a planter, and a duty he owes to his posterity. All rural affairs should be carefully noted down as they are performed; and the several heads methodically arranged during the winter-months, when the season for labour has gone by. Thus no time will be lost: the labour will repay itself, and, in a very few years, the more sterile parts of the estate, which it is your intention to cover with woods, will have become productive, and prove a source of affluence to your family. The reward for my advice, will be to hear of your success. Farewell.

Dated, *au Perreux*, 22d September, 1802.

SELECT ARTICLES

UPON

THE ROBINIA PSEUDO ACACIA.

 No. I.

Important Information for Agriculturists, extracted from the Journal of Economy—Journal Economique—for February, 1759.

M. J. BOHADSCH, Minister of Commerce to the Queen of Hungary and Bohemia, Professor of Medicine and Natural History in the University of Prague, &c., lately published in that city an interesting detail of a method, by which an additional supply of fodder for cattle may be obtained.

We know by experience that grass, the produce of our meadows, is liable to failure ; sometimes its growth being prevented by seasons of drought, at others by an excess of wet, which causes the loss of a great part of the hay-crop. Nothing, then, can be more desirable than to

be informed of a mode, by which these evils may be remedied ; and this is the object which M. BOHADSCH had in view, when he wrote his memoir for his fellow citizens of Prague.*

The tree in question came originally from Virginia and Canada, but will succeed perfectly well in Europe, particularly if planted in dry soils. It belongs to the leguminous tribe of plants, every one of which may be used as food for cattle. The taste of the leaves, and the form of the silicle or seed-pod, evince its analogy to the trefoil, the vetch, and other plants of the same family.

M. BOHADSCH found by observation, that the leaves were eagerly eaten by cattle. He says they are more nutritious than lucerne, clover, saintfoin, or other artificial grasses ; and

* The English reader is informed, that in this, and the succeeding articles, many repetitions inevitably occur. It appears to have been the object of M. DE NEUCHATEAU, to give his friend a detailed account of all the facts that had come within his own knowledge, of the habits and qualities of the tree. These facts he has given in his letter ; and then has had recourse to collateral evidence, with a view to confirm what he had previously advised. I have, however, suppressed numerous passages, which could not only not instruct the reader, but must inevitably be a severe tax upon his patience. When these French works were written, knowledge was confined to the few ; and, consequently, much of the history of the beautiful exotic, which forms the subject of this work, was unknown. But now knowledge is widely diffused : hence, while a variety of interesting facts and observations are retained, it has been thought superfluous to include others, that are merely repetitions.—*Translator.*

he therefore advises, that the tree be cultivated to such an extent, as to afford a sufficient supply of summer-feed, in order to store up hay and other crops for the cattle during winter : and even in that season, he says, the dried leaves of the tree may be used, for they are found to possess the fine odour of the best hay ; and may be mixed with it, given alone or chopped up with straw, the flavour of which it greatly improves, and cattle greedily devour it. M. BOHADSCH mentions the following fact, tending to confirm his opinion of the nutritive property of the leaves. He had five cows, one of which gave less than her due proportion of milk. He fed her on the leaves of the acacia for two days, and she yielded more milk than any of the other cows that had been fed in the usual manner.

It is easily cultivated, and prefers a dry and elevated situation, requiring little water. Plants of one year old will be five feet high, and an inch in diameter, proving its rapid growth. When the tree is to be propagated from shoots and suckers, the former are to be taken from the collar of the stem, the latter from the ramifications of the roots, and planted in nursery-rows, to form a plantation. If an old tree be cut down, and the roots left in the ground, a numerous progeny of suckers will spring up, which may also be taken to increase the nursery. M. B. removed a four-year-old acacia, and ob-

tained from the roots which were left in the soil fifty-seven suckers; whereas, had the tree remained, the roots would not have thrown up above three or four young shoots. Plants may also be increased by layering the shoots.

As this tree evidently delights in dry spots, it would be right to plant it on high and barren heaths, patches of untilled ground, the streets and causeways of villages, and places of little importance, by which means a vast extent of waste land might be turned to good account. In districts where meadow-land is scarce, a substitute for grass could be introduced; so that farmers and laboring men would be enabled to support a greater number of cattle. In consequence, more manure would be obtained to enrich the ground, and the harvest would become more productive: milk, butter, cheese, bread, and meat, would be placed within the means of the poorest cottager; and thus it must be apparent, that great advantages must result from a general cultivation of the acacia.

The tree ought never to be planted in rich and cultivated land, where its wandering-roots may interfere with other crops. A prejudice exists against the sweet bark of the tree, that is said to injure horses, which eat it with avidity; but as the tree possesses no dangerous quality whatever, this objection is groundless.

The German Memoir, from which the foregoing paper was extracted, was sent by the author to M. BERNARD DE JUSSIEU, Member of the Academy of Sciences, and Botanical Professor to the King's Garden, who thought it of so much importance that it ought to be made public.*

Remarks by M. F. DE NEUCHATEAU upon the foregoing Article.

Notwithstanding the publication of this "important notice," and the favorable opinion that it ought to have acquired on the authority of M. DE JUSSIEU's Report; it appears that no experiments have been hitherto made in France with the leaves of the robinia, as fodder for cattle. The enquiry, however, is one of importance; for the leaves may be cut and dried twice in the summer without injuring the tree, which bears pruning remarkably well, and they possess both medicinal and nutritive properties. It would be, therefore, very desirable to establish, upon undeniable evidence, the great advantage that might accrue from the use of the

* The above article has been somewhat curtailed, for the same reasons that have been already stated. I have only extracted those parts which contain matter worthy of attention, and perhaps of experiment, in this country. The circumstance that cattle eat the leaves of the acacia with avidity, is well known to me; but I have no means of trying the scheme extensively. Indeed the application of the fact, on a large scale, must be a work of time and difficulty.—*Translator.*

foliage as fodder ; and to institute trials of the same kind with every tree and shrub of the leguminous tribe, which may appear essentially to abound in nutritive properties. The *cytissus* of the ancients, which I believe is now unknown, must have belonged to this family. The celebrated Haller, whose name is a botanical authority, prefers the *coronilla emerus* (scorpion senna) to the robinia. In the list which he gives of the wild trees and shrubs of Switzerland, we find, “ Art. 123, *Coronilla frutescens, siliquis gracilissimus—Emerus cæsalp.* page 117—found at the foot of Jura and the Alps. This shrub is equally estimable with the *aspalathi*, or false acacias of foreigners, the qualities of which are very far inferior to those of the *emerus*.”—*Memoirs of the Economical Society of Berne, part 2, p. 41, 1763.*

No. II.

*A New Treatise upon the Tree, called Acacia, printed at Bourdeaux, in 1762, extracted from the Gentleman Cultivator, or the Complete Course of Agriculture, by MR. HALL, translated from the English by M. DUPAY D'EMPORTES, vol. 16, 12mo, p. 228,**

THE acacia was not known to the ancients.† Modern authors, since its introduction into France, have attempted to describe it; but have said little to the purpose respecting the uses of the wood, and of the profit which may be derived from the cultivation of the tree.

It may undoubtedly be raised from seeds, but we do not recommend this method of procuring the young trees: it is too tedious and hazardous. A safer plan will be, to purchase young well-rooted trees, and plant them in nurseries, by which much time will be gained and success

* This article, like those already mentioned, is much curtailed; and only the remarks retained which bear a new feature, or throw additional light on the subject under consideration.—*Translator*.

† Classical readers of Greek and Latin authors will not be surprised at this assertion when they consider, that the family of acacia is of a totally distinct character from the *pseudo* (*false*) acacia, the subject of this work.—*Translator*.

more certain. Trees, two years of age, should be set out at once, in situations where they are to remain.

They should be chosen with an erect stem, and of a medium size, as trees of this description have frequently been found to grow more vigorously, and to surpass in size and beauty others which, at the time of planting, were older and of larger dimension. Young plants speedily adapt themselves to the soil, and push at once into rapid growth. Plants of but one year old, from the seed-bed, should however go for a time into nursery-rows, where they protect one another from being injured by winds until they gain strength.

There are few land-owners who do not possess situations suited to the acacia. It delights in warm and light ground ; but it also grows in clayey soil, if the surface be not of too hard and binding a quality. It does not succeed well in hot close valleys ; therefore, airy situations, exposed to the north, should always be selected for it. In the nursery-rows, young acacias should stand five feet apart, every way ; and when finally planted out as tall standard trees, the distance between each should be fifteen feet : thus about one hundred of them would occupy an acre of land. The lower branches of each should be carefully pruned off, to promote the growth, to give straightness of

stem, and a regular and handsome head. The whole of the soil should be moved and turned three times in the year ; but, in performing this work, great caution should be used to avoid injuring the roots, and the young suckers that arise from them. This caution will be amply repaid by the rapid advance of the plants. Those in the nursery-rows may be removed in two years after they are planted : the larger are to be selected for trees, and the smaller are to be again planted in a fresh nursery-bed.

The transplanted trees will attain a considerable size in three years, and yield a profit. Many of the branches must from time to time be taken off, which, if not removed, would prevent the tree from forming a tall straight stem. No irregular shoots should be left on : those that are well placed and erect may be almost seen to grow. A wood of acacias attains perfection in about ten years, when it becomes very profitable : much more so than an oak coppice of similar extent, and three times the age. The former may be cut five times in the course of ten years, for serviceable wood, as poles and props for vines, whereas the oak can only yield one cutting in the same period.

In addition, the suckers that are produced every year will, as we shall soon see, yield a considerable profit. The earth should be well trodden round the stems of the trees at the time

of planting, otherwise the air will penetrate to their roots and dry them; and as this tree is peculiarly liable to be injured by drought, no time should be lost in replanting, or a total failure may be the consequence. Acacias should not be out of the ground many hours; therefore holes should be prepared, and earth for covering the roots ought to be laid ready, before the plants are lifted from the soil.*—Many persons have failed in their attempts to form a plantation of acacias, solely by neglecting these precautions, or by not planting the trees, in an appropriate soil and situation.

At the time of putting out the young trees, and during the first succeeding spring, the crown, or that part of the stem which joins the roots, should be kept with only a shallow covering of earth; but at the first subsequent digging, the soil must be levelled and brought close round the roots. When the trees have been thus planted, with the cautions above recommended, they may be cultivated in three several ways, which have been proved experi-

* Perhaps it will be always desirable to have ground prepared and entirely ready, before trees of any kind are taken up; because they will sustain less injury, in proportion to the unaltered state of the radicles. Nevertheless, it cannot be denied, that weeks may elapse between a removal and transplantation, without the tree sustaining a corresponding injury; and in the course of this work it will be shown, that the acacia can be exposed to frost, snow, and a long journey, and yet succeed well.—*Translator.*

mentally to bring considerable emolument : each of these will be now described. The first is the most simple and commonly adopted : it consists merely in working the soil about the stem of the trees, from time to time, and leaving them to nature. After fourteen or fifteen and up to twenty years, they will have become tall standards. The acacia costs little or nothing if left to itself, but in that case it yields no annual profit : that can only be obtained, when the trees have acquired sufficient bulk to be cut for beams and girders. The wood is then as hard and compact as that of the oak ; and, at the end of thirty years, has been found in as good condition as when it was first manufactured. A tree of large diameter, but which is not of sufficient length to be cut into girders, may be sawed into joists, planks, and flooring-boards : the timber, if well squared, is also applicable to many kinds of carpenter's and turnery work. The older the wood, the more solid will be the planks. Aged timber abounds in veins, which essentially contribute to its beauty, and render it fit for cabinet-work. By age, too, the colour requires a reddish tint ; but it then must be worked with judgment, as it is liable to split.

When the acacia has established its roots in a soil that exactly suits it, the rapidity of its growth is such, that, at the age of ten years, it has been known to furnish planks of nine or ten inches in breadth. The author of this article

asserts, that, in 1730, he planted twelve acacias, which had become so large in 1740, that he had them cut down; and furniture of every description was made of the wood. The stumps of these trees continued to produce wood of such luxuriance, that they were again cut in 1750, and the wood was employed in the same way; and the trees are now of sufficient size to yield timber of equal bulk and quality.

No wood is more durable than that of the acacia. Neither walnut nor oak surpasses it, although the fact is not generally known. We are assured, that the author had chairs and wardrobes made of it, which, after twenty years' service, were more beautiful than when they were perfectly new. For cabinet-work and furniture, the heart-wood of the stem only should be used: that of the branches is subject to be worm-eaten, which renders it liable to break.

The second mode of culture is to cut off the heads of the trees, at the age of three years, in March. Two months after the operation, no appearance of it will be perceptible, in consequence of the rapidity with which the new branches will have increased in numbers and luxuriance. The head becomes more close and compact, and the trunk increases in diameter, but it ceases to grow tall. When length of stem is desired, it can always be obtained by trimming and cutting off the lower branches, leaving the

one which is most perpendicular to lengthen the stem. Beauty of stature is not, however, the present consideration: the object to be kept in view is, to procure poles and props for various purposes, as articles of profit; and these will be obtained most abundantly, by thus heading down the trees.

Vineyards are very general in France, and it is extraordinary, that the requisites for them should not be attainable in their immediate neighbourhood. Props for the vines* form one of the principal sources of expense: without them, the trees cannot support an upright position, and the fruit, as a natural consequence, can never be perfectly matured. The scarcity and high price of the material used for vine-props, have compelled many proprietors to exert themselves in order to obtain a regular supply of some description of wood; and, consequently, extensive plantations of the white hazel (*aubaredes* or *aubiers*) have been made. Barren heaths or plains (*les landes*) have been broken up, in order to sow and cultivate the pine, white mulberry, and ash. The alder too, and other

* "Props for the vines." The original word, which I have in most instances translated "props," is *œuvre*. It literally means *work*; but, in the article under consideration, has evidently a local, technical signification, not noticed in any dictionary that has come under my observation. It implies wood or branches of trees applied to, or worked up for, the use of the vineyards. Hence I feel myself authorised to render it as above.—*Translator.*

aquatic shrubs, have been resorted to; but no one has hitherto thought of cultivating the acacia, nor indeed is its peculiarly prolific nature generally known. In fact, it is the only tree capable of supplying the deficiency of willow and pine wood, which sometimes occurs, in consequence of a variety of accidents to which those trees are liable.

The white hazel is particularly subject to failure; and the wood, therefore, becomes so scarce and expensive, that many proprietors of vineyards, are obliged to leave their vines without props. The wood of this hazel is generally preferred, because it is straight and light; but it can only be grown in bogs and marshes, and these situations are too rare, to furnish a supply so ample as to meet the demands of a country abounding in vineyards: besides, the tree is subject to so many casualties, that numbers perish every year; and this tends to keep up the price, especially as the cultivation of the vine is annually increasing. The proprietors are always obliged to purchase props at second-hand of the dealers; and as these persons hold the whole stock, they make their own terms. The cause which enhances the cost of this species of wood, is its perishable nature. It grows only in water: therefore, when it is removed from its favourite situation, it soon dries and decays, especially in the gravelly and arid soil about

Bourdeaux, wherein the vine-props are obliged to be renewed every alternate year.

Recourse has been had to the pine as a substitute, and the quality of the tree is certainly excellent. It is light, of sound and even growth, the vine attaches itself to it and attains a great height, and the wood is more durable than that of the willow. But the disadvantages attending its use are, that it breaks at the knots when the stakes require to be fresh pointed, and it can only be grown at a distance from great rivers. Hence the difficulties and expense of conveyance must prove insurmountable obstacles to its general utility. But the chief objection to the pine is, that when the tree is cut down, it neither sprouts again, nor yields any suckers from the roots. It appears as if nature intended to make amends for this imperfection, by having enabled it to grow in the most sterile spots, to attain a prodigious height, and to produce in great quantities a variety of substances, all more or less essential to the service and even the health of man. This incapacity of the tree to sprout again, when cut down, renders it inapplicable to the purposes of the vineyard, even if the vine-props, which are cut out of the solid wood of the stem, be taken into the account; because it is seldom that ground can conveniently be found suitable to its cultivation.

The white mulberry is planted with a view to

procure wood for props ; and it is not only very good in quality, but lasts well. The objections to it are, that it is of slow and unequal growth, and requires a long time before wood of sufficient size can be obtained. Even when a plantation succeeds, it cannot be very available ; and the attempts have in general been abandoned after much expense has been incurred.

The ash, as well as several kinds of aquatic trees, have been found to yield good materials for vine-props ; but they are rarely employed. The willow and pine are almost exclusively to be found, as articles of commerce in the market for this purpose.

The acacia, on the contrary, possesses all the good qualities of the above-mentioned trees, without their defects : it succeeds well, and grows rapidly in the hottest and most sterile situations : the more it is cut, the more vigorously it shoots, and multiplies itself by its suckers. These are properties which belong exclusively to this tree. The wood is more firm than that of either the sallow or the pine, the poles are straight and light when in a dry state, and neither bend nor break till they become very old. They are so durable, too, that after being in use for five or six years, they are undiminished in size : indeed, they have been known to remain sound for more than ten years, which is one great advantage ; and another is, that as

they do not require to be either reversed or sharpened, both time and labour are saved.*

Enough has been already said to show the great utility of the acacia, and the profit to be derived from it when it is properly cultivated. This second method is far more advantageous than the first; for, after the tree has been headed down, it produces vigorous shoots in abundance, which, at a year's growth, are large enough to be used for props in those vineyards about Bourdeaux, which are known by the term *graves*;† but they ought to be left to acquire more strength and consistence.

The wood of two years' growth will yield poles of three different sizes: some will be above two inches thick, and fifteen or sixteen feet in length; others will run less, but the quality and durability will be in favour of the

* The foregoing observations are strictly applicable to France as a vineyard country, but might perhaps have been omitted in the translation. I considered, however, that if we do not cultivate the vine in vineyards (though that, perhaps, might be attempted successfully in several of the southern counties), we have numerous hop yards or gardens, the plants of which require long and durable poles. What the acacia is stated to be in a country of standard vines, it may become to us for the support of the hop. The subject assuredly merits attention and a fair trial.—*Translator.*

† *Graves*. *Vins de graves* is a phrase familiarly known among amateurs of French wines. These wines are the production of the vineyards alluded to in the text.—*Translator.*

latter. They are to be sorted, and kept apart. The main stem might be sawed up for posts, which would be found much superior to those of oak or Spanish chestnut ; but this part of the tree may be turned to far greater advantage, by being cut into planks for furniture.

If what has been already stated shall lead to the cultivation of this tree, we may safely assert, that in ten years, a large quantity of profitable wood will be grown, and ready to be turned to a variety of useful purposes. The bulk of timber produced, and the dimensions in length and breadth of stem, must be, of course, in proportion to the age of the tree ; but the expense of its culture is less than that of other trees. It requires no defenses, is hardy, and subject to no diseases : no species of vermin attacks it, no animals can injure it ; for nature has not only provided it with numerous thorns, which defend it from their assaults, but has given it an altitude of growth, which renders its highest boughs wholly inaccessible. Birds of prey are never known to build in its branches, and toads and serpents avoid its shade. It is for these reasons that the tree is planted in towns, and in the vicinity of dwellings. The wood is so hard, that it never becomes worm-eaten,* insects can-

* That is, the wood of the trunk. Some of the branches, the author tells us at page 54, are liable to be worm-eaten, and are therefore not so well calculated for the cabinet-maker.—*Translator*,

not injure it: hence its value for furniture. It remains uninjured by time, in this quality greatly surpassing the oak, which, in advanced age, is subject to decay.*

There is still a third mode of cultivating the acacia, preferable to the two former, which consists in cutting down the trees level with the ground, when they are three years old, instead of merely taking off the head. By this method, a much greater annual return is obtained, as the following statement will show. It is true, that the idea of deriving all the advantages from the body of the tree, of which we have spoken, must be relinquished; but this loss will be, in a short period compensated,

1st, Because the wood of the stem is, at all times, more valuable than that of the branches.

2nd, Because the stem always becomes larger and stronger, in consequence of being cut down to the ground.

3rd, Because the tree sends up a greater

* The building of York minster was begun in 1171, and the choir was destroyed in 1829. The material employed was oak; and those parts of the timber which were not injured by the fire, are as sound as they were when the magnificent structure was first raised. Of this I possess an interesting proof, in a portion of the choir, that was probably a sapling during the Saxon heptarchy. At what age does the oak "become decayed?"—*Translator.*

abundance of suckers, its roots extend much further, and produce a vast number of young plants, which may either yield materials for vine-props, or be planted out in nurseries. The progress of a plantation is, by these means, so very rapid, that unless it come under actual observation the fact can scarcely be credited.

Some years since, the author of this article cut down an acacia, which stood in the middle of a field : in the following year, the butt threw out so great a number of roots, and to such a distance, that five hundred young plants were produced, which were taken up in the following year, and placed in a nursery. The great profit thus realized determined him to fell thirty other acacias, which stood in rows ; and from their roots, more than ten thousand plants were obtained. In the second succeeding year, he cut ten thousand poles, and sold two thousand young trees. These are absolute facts, well known to all his neighbours ; and yet the whole were produced upon half an acre of land.

This experiment, and some others which he has since made, have proved to him, that an acre of ground, planted with acacias according to the foregoing directions, would, if divided into two portions, yield ten thousand props for vines, as well as a great number of young plants either for sale or for future cultivation. If sold, the trees would bring in two hundred livres

(above eight pounds sterling), without having caused any material expense. This sum is at least twice as much as would be gained by the produce of an acre of wood, of vines, or even of meadow-land. It must be observed, that when these trees were removed, the whole of the ground was cleared and grubbed up, in order to admit vines, which were planted in the following spring. Not a vestige of an acacia was left on the surface, and the proprietor believed that the roots also had been entirely destroyed: he was therefore much surprised, in the succeeding year, to find that above six thousand acacias had sprung up; and more so when he ascertained, that not a single vine-plant was injured, although they were surrounded by these interlopers, which had not only outgrown the vines, but entirely covered them.

It cannot be doubted that the acacia, while it is young, sympathises, if the expression be admissable, with every other species of tree; and may therefore stand in nurseries with the vine, without injuring it. This at first will appear surprising; but, upon reflection, considering the habits of the two trees, this assimilation will be found perfectly natural: the former sends its roots horizontally, while those of the latter penetrate to a considerable depth. It is customary to cut off those roots of the vine which rise to the surface; because it has

been proved,* that the deeper the roots penetrate, the more the tree will flourish; and the less injury it will be likely to sustain, from the influence of solar heat. It is for these reasons, that young acacias do no injury to vines, but on the contrary, afford them shade and protection. After the second year, however, they must be separated; or that which constituted a friendly shade, while the trees were young, would, from the rapid growth of the acacias and the great extension of their roots, become ultimately fatal to the vines.

The author planted likewise an orchard of chestnuts, where acacias had been cut down. Numbers of suckers sprouted from the old stocks, and in the first year overtopped the three-year-old chestnuts, which, however, remained uninjured, and both kinds of trees flourished without interfering with one another.

* This system is exploded in England, where finer grapes are produced (under glass) than in any natural vineyard throughout the world. We find, on the contrary, that shallow borders of rich, light, rather sandy soil, upon a deep substratum of limestone crag, or artificial bed of stony fragments, are in every respect most propitious to vine-culture. These afford drainage; and at the same time they constrain the roots to extend horizontally, and to remain near the surface, to which they are further invited by the attractive agency of a superposed covering of fermenting matter, as littery mulch, decayed leaves, and the like. France, it is true, possesses an arid soil, a burning sun, with gluts of rain at long intervals. These differences of climate must of course be duly considered.—*Translator.*

As the acacia produces immense numbers of small branches, armed with spines, a portion of these must be pruned off three or four times during the summer, so as to leave but a small head of few boughs. Were these all allowed to remain on, the head would become disproportionately large, and overpower the trunk, and prevent it from rising to its proper height.

It will not be sufficient, merely to dig the ground about the roots of the trees : the whole surface must be lightly moved three times in the season. These diggings encourage the extension of the roots, and greatly increase the number of suckers, one of which is produced from every knot. Care must be taken not to damage these knots or germs, which, if kept well covered with earth, will soon push and become trees, and thus extend the plantation.

The whole secret of this prodigious increase consists, in cutting back the superfluous lower boughs, and keeping the surface of the soil clean and open.

The acacia may be cultivated by the three methods described, and upon the same piece of ground ; but the plan is not recommended. It will be better to divide the ground into three portions, one for full standards, to yield large timber and fire-wood ; another part, for those that are to be headed down for props and poles ;

and the third piece for a nursery of the plants, which are to be cut down to the ground, or prepared for stocks. By whatever method the trees are cultivated; those only are to be permitted to take an upright growth, which have straight and long stems. All the superfluous lower branches are to be timely removed, with the exception of the central one, which proceeds from the main stem. At the age of five or six years, the trees are to be cut down, and the wood of the trunk will make durable hoops for tubs and vats: the branches also will do well for smaller hoops for wine-casks. It should be split as soon as it is cut, or it will become too hard and dry for that operation to be performed with certainty.

If an acacia die, its loss is speedily supplied by its progeny, because its roots retain vitality, in this respect differing from all other trees, whose tops and roots perish simultaneously. Its reproductive power is such, that if a thousand plants should perish, ten thousand would rise from the roots in the following year.

This tree may be made to supply the place, not only of the oak, but likewise of the elm and the walnut-tree, when planks are the material required. Its wood will compete with that of the willow for the purpose of making vine-props, and with the chestnut for the manufacture of hoops: indeed, by prudent management during

its culture, it may be made to produce *matériel* for all the purposes of the planter.

I have discovered another mode of raising this tree, from which much pleasure as well as profit may be derived : this consists in planting it round the vineyard, so as to form an enclosure. A hedge of acacias in full vigour is a most formidable defence against every attack. If the lower branches be interlaced, and those of erect growth be suffered to ascend, a double advantage will be secured : the wood may be cut for poles and props every two years, and the hedge in consequence will be rendered more impervious. Where the acacia has been substituted for the white mulberry, as a hedge, the former has always been preferred, because of its thorns, in which the latter is deficient ; and although the mulberry must be allowed to yield excellent wood for poles and props, yet it is of tardy growth, and requires double the time to produce branches of equal size with those of the acacia.

The appearance of the country would be much improved, if the highways and hedges were planted with the acacia : black and white thorn are very ornamental, when blossoming in the spring ; but can bear no comparison with a hedge of the acacia, especially when it is covered with flowers.

With so many advantages before us, the cul-

tivation of this tree ought to become an object of general interest, especially in the vineyard countries,* where materials for training the vine become more and more scarce every year; and where no exertions are made to repair the rapid consumption of these materials, by the formation of new plantations.

Observations of M. DE NEUCHATEAU upon the foregoing Article.

This treatise upon the robinia, first published at Bourdeaux, then reprinted at Paris, was, about the same time, translated into several foreign languages. It produced a great sensation in Germany, as appears by the account given of it by the celebrated HALLER, and by the Journalists of Gottingen, Leipsig, and Erlang. The German edition was published at Carlsruhe, by MAKLOT, in 70 pages 8vo, 1766—*Neue Abhandlung von dem Baume Acacia oder Schotendorn*.

The success of this work among the Germans has made us forget, that it had its origin in France. It was the production of a nameless French author, who, we cannot but regret, did not make himself known; for his little pamph-

* In England the hop-gardens have the same claims, durable hop-poles being an object of great importance. This has been noticed before.
Translator.

let of forty pages has been of greater use, than many ponderous volumes.

Although the author foresaw, as well as proved, the success of his labour, he maintained his incognito, an instance of modesty to be admired. To promote the welfare of our fellow-creatures is in itself a pleasure; but to effect this, and remain concealed, is to unite virtue with self-gratification. The catalogue of BOHMER, which is in general correct even in *minutiæ*, is however erroneous in this instance. It states the author of the treatise, printed at Bourdeaux, to be M. MAXIMILIAN GUILLAUME REINHARD, whereas he was the translator at Carlsruhe: this error has been copied by others. M. PÆDERLE, the author of the *Manuel de l'Arboriste et du Forestier Belgique*, had not seen the work in French, and mentions it as a German pamphlet. He quotes from and speaks favourably of the treatise, although he qualifies his praise by saying, that it contains too much of the marvellous. M. PÆDERLE however is of opinion, that the tree merits the attention of agriculturists; and endeavours to stimulate his Belgic countrymen to cultivate it, by citing numerous examples of the success of the tree in Louvain, Brussels, Enghien, &c. &c. He observes, " There is a very fine robinia growing in the botanical garden of Louvain, thirty-six feet in height, and seven feet in the girth: also two others, as fine trees, decorate the centre of

the park at Brussels, from which an opinion may be formed of the beauty of this tree."

By comparing the remarks in this pamphlet, with the other articles in the present collection, a very comprehensive idea is given of the singular advantages to be derived from a general cultivation of this tree. I remark, however, that none of the writers insist strenuously upon the superiority of the method of raising it from *seed*. That mode, in my opinion, ought always to be preferred to planting; or, at all events, it should be adopted with the other modes of culture. A handsome full grown tree can only be obtained from seed. One so raised would, in ten years, be much larger than a transplanted tree of the same age, though the latter were five or six years old at the period of planting. Indeed, to insure perfect growth and beauty, the trees should never be injured in any way whatever, and therefore should not be removed from the spot in which the seed was first sown. Nature proceeds in this way, and art should not act contrary to her example. This remark may tend to rectify the erroneous statements, that will appear in some of the following articles: they contain a number of contradictory statements which could not be reconciled, without adding a variety of repetitions to a work, which it has been my object to curtail rather than enlarge.

To my present remarks I must add, that the writers of No. V., VI., and VII., are still living (1802); and I owe them, in common with other agriculturists, my sincere thanks for their laudable endeavours to extend the culture of the robinia. We ought to appreciate a zeal, the object of which is to gratify the reader, rather than imitate the censorious, who wantonly wound an author by the severity of their criticisms. It has been my wish to gather the flowers of the beautiful tree which I recommend: too many are contented to choose only its thorns.

On reperusing this treatise, I am particularly pleased with the recorded fact, that the robinia assimilates in its growth with other trees, the chestnut for instance, without producing inconvenience or injury; and I have noticed in my letter the circumstance of its harmonious blending with the oak, in the demesne of Morfontaine, a spot that may be taken as a model of landscape scenery and decoration.*

* M. MOREAU DE LA ROCHETTE, then Inspector General of Nurseries (*pépinières*), planted the park of Morfontaine. The plants were taken from his own nursery of La Rochette near Melun. Acacias still remain there of from ten to fifteen inches in the girth (three or four *deci-mètres*), and some of even larger dimensions.—*Original Note*. The word nursery, used in this note, must not be confounded with, nor considered synonymous, with our term nursery-grounds. In France, where until of late years the only material used for fuel was wood, the preservation of the woods and forests was an object of national importance:

But there are situations, where, although, neither oak nor chestnut will succeed, the robinia will thrive well; and as it affects the shade, and prospers most when surrounded by a coppice of under shrubs, it should be accompanied by plants that, in common with it, prefer a soil of indifferent quality. For this purpose, I know of no tree so well adapted as the odoriferous cherry of St. Lucie, *cerasus Mahaleb*, as it will grow in any soil, scarcely ever rises above thirteen feet (four *mètres*), and is always pleasing as well as useful. The plane maple, *l'érable plane*,* grows as readily as the *C. Mahaleb*, but it attains a much greater height. Both are indigenous with us.

Many other appropriate trees may be found among exotics; and upon this subject, the reader should consult the very instructive memoir of M. DE THOUIN, upon the Advantages of cultivating Foreign Trees to render different Soils available (*pour l'Emploi de plusieurs Terres de différente Nature*), which have been abandoned as unproductive.—*Trimestres de la Société Royale d'Agriculture de Paris, Hiver, 1786.*

hence, doubtless, the necessity for those extensive plantations of young forest-trees—hence too the office of Inspector General of Nurseries.—*Translator.*

* This is doubtless the *acer pseudo platanus*, the sycamore.—*Translator.*

No. IV.

Memoir upon the Culture and Uses of the False Acacia, in the United States of North America, presented at the public sitting of the Agricultural Society of Paris, held on the 30th of March, 1786, by M. ST. JEAN DE CREVE CŒUR, extracted from the Autumnal Quarterly Report of the Agricultural Society, 1786, p. 122.

THAT immense extent of territory, now forming the United States, presents to the naturalist and botanist a new and interesting field for discovery, the variety of climates and soils in which has produced numerous plants, heretofore unknown in Europe, and which are likely to become exceedingly useful to France. Among these, the acacia appears to me to merit particular attention. I have, therefore, communicated to the Society, every particular that has come under my observation, concerning the mode of culture adopted by the Americans, and the purposes to which they apply the tree. I write only as a cultivator (such I was in America for many years), and not as a scientific botanist.

The two-thorned acacia (*robinia pseudo aca-*

cia) is indigenous in the middle states. I have seen it, in the forests of Pennsylvania, Maryland, Connecticut, New York, and Massachussets. The colonists were first induced to distinguish the tree from a multitude of others, by the order, arrangement, and beauty of its leaves, and the sweet scent of its flowers. They soon, however, ascertained the astonishing durability of its wood, and the rapidity of its growth; and, struck by the advantages thus offered to them, they collected the seeds, and formed nurseries of the plants, particularly in the county of Lancaster. Shortly after this, they began to plant the tree in favorite spots, before their doors, and round the grass-plots, where the American women are accustomed to spread out their linen, to whiten by exposure to the dew. It was soon observed, that the shade of the tree, so far from producing aridity of the soil and destroying the grass beneath it, strengthened the herb and rendered it sweet and luscious, so that cattle ate it with greater avidity than any grass that grew elsewhere. This induced agriculturists to plant it in their meadows, and similar results ensued. Soon after, the acacia was planted in the vicinity of wells and running brooks; and especially near those places, where horses are usually taken to water, with a view to afford both shade and shelter.

The favourable opinion formed of this tree, and the accounts of the purposes to which it was

applied in Lancaster county, were speedily disseminated, through the medium of the gazettes, as well as by the reports of travellers. No time was lost: immediate trials of the wood were made, by which it was satisfactorily proved to be harder and more durable than any other. Ship-carpenters employed it for the chief timbers of vessels; and experience taught them, that pins or nails (trunnels) made of it, remained sound as long as the ship itself lasted. Such was the origin of that reputation which the acacia so justly acquired in North America, above sixty years since. About that period, a colonist of Long Island planted a great number of these trees, over a large extent of sandy ground. He was induced to do so by the advice of a traveller, to whom, according to the custom of the country, he had afforded the rights of hospitality.

These trees were planted very closely; and at the end of two years, to the surprise of himself and his neighbours, it was found that a fine herbage had covered this hitherto barren tract, which was greatly preferred by cattle to the grass of the more fertile meadows. In twelve years, the owner felled the greater number of his trees, which had formed a thick wood; and those which remained standing were left at twenty-four feet distance from one another. Part of his house was built with acacia, parti-

cularly the shingles* for his roof. About seven months since, I saw one of these trees, which still remained standing.

Nurseries.

This satisfactory experiment made a great impression, as might be expected, upon many experienced cultivators on the spot, who, as well as others residing in neighbouring states, resolved to form nursery-plantations of the tree. Their mode of doing this was the following, and it is still practised in the country.

The seed is sown in the spring, in garden-beds composed of good earth and sand; and the rising plants are protected from the sun's direct rays, which would soon scorch the plantation, by a covering of mats. If there be but little rain, the trees are occasionally watered. I have seen some which grew to the height of two feet, in the first year. To secure sound and fertile seed, none must be employed that has ripened on a solitary tree; but it must be collected from one which is surrounded by several others. I am not able to assign a philosophical reason for this fact, which, however, has been confirmed by reiterated experiments.

* Shingles are a kind of wooden tiles. The white cedar is chiefly used in America for shingles, and is found to be very durable.—*Translator.*

About the third year, the young acacias are transplanted into the nursery, where they remain till they acquire sufficient strength to be finally removed, either to form avenues by the sides of enclosures, or to become close woods. The great range which their roots take frequently causes the heads to spread so much, as to be too heavy for their stems. In that case, the shoots must be carefully thinned out, or the stems effectually secured by props, otherwise their extreme brittleness will render them liable to be broken. Nothing is more easily effected than the transplanting of this tree ; for nature appears to have conferred on it a hardihood of constitution, which she has denied to other trees, to complete its usefulness.

I know, in fact, of no other tree, which will take root after removal with equal certainty of success as the acacia, however mutilated its roots may be.

In various parts of the United States, Connecticut and Rhode Island particularly, the inhabitants raise their trees by a method somewhat different : it is not so speedy, but more suitable to the cultivators, who are perpetually impeded in their operations by the scarcity of labourers ; or intimidated by that excessive price of handicraft, which is a necessary consequence of this scarcity.

Were not the enlightened industry of the Americans checked in its attempts, by this prevailing obstacle, the agriculture of that country would become as interesting, as the country itself is on many other accounts.* To cite one example of the very high price of labour, I shall only observe, that I gathered in seventeen different harvests, during my residence in America ; and in no one instance did I ever give to the labourers, who were our neighbours, less than one bushel of wheat per day, besides allowing them food of the same quality, as that which I should have placed before our dearest and most respectable friends.

The acacias are planted in a field in rows, which are fifty feet apart. In the following year, a furrow is traced with a plough, three feet beyond the rows of trees, of sufficient depth to touch and graze the surface of the roots. Shortly after, a great number of young plants start from the wounds made by the plough, which plants frequently attain to six feet growth in the first season. In the succeeding year, the operation is repeated ; and in a short time the field is converted into a well furnished wood, and at a very trifling outlay. I have seen hogs

* Nearly fifty years have elapsed since this article was penned. The price of labour is still high, and labourers are amply remunerated ; but the energy of such a people, under a federal and wise government, has effected mighty changes. Obstacles are removed, difficulties overcome, and prosperity is universal,—*Translator*.

turned into such a field, for a few days only, it having been found that, by grubbing among the roots, they have rendered them very prolific, vast numbers of young acacias having been by that means produced.

These nurseries and plantations will require no other care or attention, than to be protected by a good hedge, to secure them from the inroads of cattle, which are extremely fond of the leaves of the acacia. In the two Carolinas, Georgia, and other southern states, the cuttings of the young shoots are collected and preserved with great care, as wholesome forage for young colts and sick horses. A fortunate chance in the first instance, and a spirit of close observation, had taught the Americans, that the acacia throve best in light and sandy soils: they therefore, without loss of time, planted it in poor spots, with the idea, that, as the roots and leaves, as well as the drops of water which fell from them, appeared to induce fertility, these barren spots would be converted into good and productive soil.

I am not aware, that there is any tree which vegetates so rapidly as the acacia. In the month of April, I cut down a young tree, which was only seven feet in height, to make two hoops. In the following October, the shoot that had proceeded from the stock was ten feet high, and three inches and a half in circumfe-

rence. I once passed a silken thread round one of my acacias in the month of June, and five days afterwards the thread was buried in the bark. Since that period, these trees have been much multiplied in every direction. They who have planted them round their enclosures, or before their houses, have, every spring, wounded the extreme roots of the trees ; and, by this simple expedient, have yearly obtained very fine suckers, which are frequently dug up, in order to force the remaining roots to furnish fresh plants.

Uses of the Tree.

The Americans make great use of the acacia : it is, in fact, one of the staple products of the soil, and a certain source of profit. I will, therefore, give a brief sketch of the purposes to which it is applied.

First, Melioration of the Soil.

It has been already observed, that the Americans plant the acacia, with the view of meliorating such poor and defective soils, as they intend to put under crop, for a series of years ; and, as the woods annually diminish in the inhabited parts of the country, it is no uncommon thing to see the old forests replaced by plantations of acacias. It is in Long Island, New Jersey, Providence, and in the vicinity of Boston, that

I have particularly noticed the good effects of these plantations. In several places there were formerly moveable sands, which were frequently raised and carried about by the violence of the wind to such a degree, that travelling was attended with danger. By means of inclosures of acacias, and by planting a great number of trees in different ways, these moveable sands have been fixed, a large extent of barren and useless land has been covered with a wholesome and abundant herbage, and the proprietors have been amply remunerated, by the sale of the timber, for all the expense and trouble that they had incurred. To be convinced of the astonishing effects thus produced, the vicinity of the small lakes of Mishipod and Mashuta, at three miles distance from Providence, should be visited. Formerly, the banks of these lakes, and the adjacent country, consisted of a barren sandy waste: for some years past, this waste has been, by the industry of the inhabitants, covered with plantations of acacias; and thus the face of the country has been changed—fertility, verdure, and a pure air, have succeeded to drought and aridity. The families of the inhabitants are accustomed to meet in these pleasant places, on days of festival and recreation.

The same metamorphosis has been effected in the environs of Patuket. The lands of these cantons are divided into small enclosures, plant-

ed with acacias. All this part of the state of Rhode Island is flat and sandy, but the sand is of rather a soft and humid quality. In my opinion, nothing could be more interesting to a European traveller, than the general appearance and state of agriculture in this beautiful district. I have, on several occasions, passed entire days upon the banks of these charming lakes, under the shade of noble acacias; and I always felt inclined to bless the memory of those worthy colonists, who, by having adopted a simple and happy expedient, have thus embellished—I may say vivified—the neighbourhood of their city, affording, at the same time, a useful and striking example, to all other possessors of land of a similar quality.

Consolidation of River-Banks.

The Americans make use of the acacia, to secure the banks of their rivers from the injury which they are liable to sustain, from the combined effects of frost, ice, rain, wind, thaw, and the power of the sun: these, by causing the banks to yield and crumble down, obstruct navigation, and sometimes carry away a portion of the neighbouring fields. To obviate inconveniences thus occasioned, the natives plant acacias very closely together; and, by keeping their heads constantly cut to the height of bushes, they cause the roots to ramify to a great distance, and thus the banks are held firmly to-

gether, and effectually preserved from the destructive operation of the waters.*

In order to afford proof of the great distance to which these trees extend their roots, I adduce the two following facts, the correctness of which I myself ascertained. An acacia, that was planted twenty feet from the parsonage-house of Jamaica (a small town of Long Island, six leagues from New York), sent a root across the cellar of the house, which penetrated the side of a well seventeen feet beyond, and to the depth of fifteen feet below the surface of the ground, insinuating itself among the stones of the well, which were laid without mortar: it then took a vertical direction; and, in the following year, it threw up a young tree, which grew to the height of several feet above the top of the well. Dr. Samuel Seabury, curate of the parish, in order to show the value which he attached to the tree, and at the same time to preserve so interesting a phenomenon, enlarged the opening of the well; and this tree, which had sprung from a root sixty-two feet in length, remained, till the English cut it down during the last war.†

The members of the church of England (*An-*

* The plane tree produces the same results, and may be employed with equal advantage.—*Original Note.*

† The war of independence.—*Translator.*

glicans) have a place of worship in the district of Philipsbourg, upon the banks of the Hudson river, ten leagues from New York, near which, as is customary, a grove of acacias had been planted, the trees of which stood thirty-two feet apart. On the 17th of June, 1769, I attended the service at this church; and being obliged to remain for a short time in the neighbourhood, it so occurred that two Sundays afterwards I again repaired to this place of worship: and I never was more astonished, than when, on opening the door, I perceived a young acacia, which, in this short interval, had forced its way through the floor, and had grown to the height of four feet. This tree was the sucker from a root, which I measured, and found to be forty-nine feet long.

The usefulness of this wood is now so well appreciated, its sale is so certain, and the prices of ship-bolts and other articles of naval construction, are so well regulated according to their dimensions and squaring (*équarrissage*), that the culture of the acacia is become an important object, which occupies the attention of numerous colonists, particularly in the vicinity of sea-ports and navigable rivers.

The following anecdote may convey some idea of the advantages to be derived from the acacia. A colonist of Long Island, with whom I was well acquainted, planted, during the first

year of his marriage, some of these trees in an old pasture-field of fourteen acres, intending not to touch them until his first child should have arrived at a marriageable age. This plantation, being completed, he took no further care of it, than to surround it with an effectual enclosure. His eldest son, having attained the age of twenty-two, was desirous to settle himself in life, and requested his father's assistance to enable him to do so. The father sent for a ship's carpenter, and sold some of the wood from this plantation of acacias, for 6250 livres, £260..8..4, which sum he gave his son for the purchase of a plantation in Lancaster county. Three years afterwards, he raised a similar sum in the same manner, with which he established his daughter. Finally, with no other resources, than those furnished by the sale of wood from the fourteen acres of acacias, planted when he himself was first married, a little fortune was provided for all his children. I saw this small but invaluable wood scarcely seven months since, and could not fail to admire the fortunate idea, which had enabled this American father to establish his children in life. Happily the war has not injured this plantation, which remains as flourishing and complete as ever. I take no notice of the fire-wood that was produced for a great number of years; nor of the quantity that was annually cut for fencing, and for repairing carts, ploughs, harrows, &c.

Another colonist of the same island, in 1769, lost nearly the whole of his black oaks, in a wood of seventeen acres, by the ravages of a species of caterpillar (*vers*), which devoured all the foliage of the trees. He had them cut down, and in their place he planted all the cuttings or slips of acacias that could be procured in the neighbourhood. In the following year he cut over the plants to the surface of the ground, and loosened the soil with an iron-toothed harrow. By thus moving the surface, the roots of the trees were grazed, which caused them to send up great numbers of suckers, that in a few years, not only covered all the loss incurred by the devastations of the caterpillars; but supplied a forest of acacias, which was infinitely more productive than the one that he had lost.

The Americans think so highly of this tree, that I have heard many colonists express sentiments to the following effect:—" May heaven grant, that, when I die, I may be able to leave my children fifty acres of land planted with acacias, and well enclosed! My house may be destroyed by fire, my harvests may fail, the contracts I hold may be violated by cross events and bankruptcies—whatever else I have to leave them, may perish by a variety of contingencies; but if I live long enough to accomplish this great object of my wishes, and be enabled to bequeath to them this proof of my affection, I shall have no reason to dread, either the ap-

proaches or the consequences of my decease : my family will be secure, and will find in this treasure, all the resources that they may require, in order to enjoy a sufficient competence (*plantations honnêtes*).”

I consider this to be so reasonable a wish, that, previously to the war, I began to plant acacias, being convinced that I should be enabled, by this means, to bequeath to my posterity unfailing resources, more than sufficient for the children of a simple American cultivator.

Of the duration of the wood.

In the year 1774, on one of the peninsulas of this island, I saw a strong post, seven feet in length and fifteen inches square, which supported a barrier-fence. It had been put up in 1696, and was brought from Rhode Island, at the time when the first colonists obtained possession of the territory. They had found it in one of the forests of the island, where they had arrived only a few years previously. Their descendants kindly allowed me to examine this post, and had it taken up, for the express purpose. I tried it in every part with the greatest care ; and can assert with truth, that I found it free from defect throughout, with the exception of half an inch, at the place where it had stood, even with the surface of the ground.

Syrup from the Flowers.

An excellent syrup is prepared in America from the blossoms of the acacia, which are preserved in summer. A pleasant beverage is made with this syrup, by mixing a spoonful of it in a tumbler of water. I have frequently presented a glass of it, to European travellers, who could never guess from what material the syrup had been made.

Props for climbing Plants.

The stakes and branches, with which many of the inhabitants support their peas and French beans, are made of this wood : they are exceedingly durable, and that portion which is beneath the surface of the soil never decays : I believe that, in vineyard-countries, the acacia would, in every point of view, become an object of great importance and of the utmost utility.

Hop-Poles.

As the American women are obliged to brew beer, for the express purpose of procuring yeast or balm (*levain*) for baking, their husbands are obliged to cultivate a few dozen of hop-plants, in order to obtain the hops that are required. I have never used any other than acacia-wood for poles, and the same set has lasted me the whole

time I have been a hop-grower ; that is to say, for seventeen years. Why then should not acacia-poles be adopted in all countries, where the hop is one of the staple products of agriculture ?

Hoops.

The Americans invariably make their hoops of hickory-wood. This tree is a species of walnut, which produces a very excellent fruit ; and the full-grown timber, it is well known, yields the very best fire-wood. Since the culture of the acacia has become more general, experiments have been made with that wood, which prove that the young trees furnish hoops of better quality than the hickory. They are not only more durable, but can support a greater tension without breaking. I have often witnessed these experiments. The lasting nature of this wood is so well appreciated, that no American vessel is begun to be built, until the shipwrights have first procured knees, stern-posts, and the other principal pieces of the ship-timbers, of acacia-wood : these sell very dear, and the price depends upon the greater or less angle of the knee-timber, and the square measure of the pieces.

In order to obtain, in one plantation, trees of proper size and quality to furnish wood suitable to the various purposes for which it may be requi-

red, trees from the nurseries are planted in an appropriate soil, at the distance of six feet from one another. At the end of three years, every alternate tree is cut down, and these are manufactured into hoops. In two years more, a similar operation is performed; and the wood is used for hop-poles, and for many other purposes in agriculture. After this second cutting, the remaining trees stand twenty-four feet apart; and then they are bent to the required angle, and fixed by means of a slender cord. In the following year, they are slightly wounded with an axe, five feet above the ground; and the sap flowing abundantly towards the wound, forms a sort of callus, and the lower part of the stem thickens considerably. The trees retain the form thus induced, and become in a few years doubly valuable, by being applicable to knee-timber of different dimensions for ship-building.

Hedges.

These are formed by sowing the seeds, or by planting young trees, in the direction of the intended plot of ground, after having well prepared the soil by a double-trench ploughing—*par deux traits de charrue, remontés les uns sur les autres*. The trees are headed down to the proper height as often as they require cutting. To thicken the hedge at the bottom, the stronger branches are brought down right and left, and plaished half through. The acacia speedily heals when

wounded ; and the callus, which the branch throws out, renders them in a few years much stronger than they were before they were cut. These hedges are not only very ornamental, but they form an impenetrable defence.—Trees are left uncut, at twenty feet distance, to rise as standards ; and these add to the beauty of the hedge, while they improve the value of the inclosure.

If a few seeds of a plant, which is exceedingly common in New York, called the devil's vine,* were to be scattered among the acacias, the hedge would acquire great additional strength ; for the amazing ramifications, and singular toughness of this species of climber, give, even to feeble bushes, a degree of strength and impenetrability that is altogether astonishing.

Mill-Work and miscellaneous Purposes.

Acacia-wood is always used for mill-work if it can be procured, because of its indestructibility, either under water or when exposed to the action of the atmosphere : for the same reason, the pillars which support the piazzas of our buildings, and the posts to the railings of our

* *Vigne du diable*. I do not pretend to determine what this plant really is. I find no mention of it in the catalogues ; and I am not sure that it is a *vitis*, although, as a climber, the wild vine of America is known to reach to the tops of the highest trees.—*Translator*.

gardens and court-yards, are made of it. Nearly all the stout barriers of the plantations in Long Island are firmly fixed in these trees, which are found to possess, in an eminent degree, not only the faculty of healing every wound, but of exerting a great contractile force upon all foreign substances that are let into them.

It has long been observed in America, that wherever acacias have grown, the soil has become singularly favorable for the cultivation of maize or Indian corn, and I have myself repeatedly proved the fact. If the beneficence of nature to mankind is manifested more in one way than another, it is peculiarly so in the gift of this grain—the manna, as it may be styled, of the country on which it is bestowed. It is, without contradiction, the most precious, the most useful of vegetables: it accommodates itself to every climate, to every soil; and is the most wholesome nutriment for people of all nations. It is to be regretted, that the great utility of this grain, and the proper method of cultivating it, should be unknown in France. Every thing that the plant produces is excellent of its kind, even to the decayed stalks, which produce manure of a superior description. How many acres of land have I seen, whereon every effort had been employed to obtain a wretched crop of wheat, which, had they been sown for a

crop of maize, would have richly rewarded the labour of the farmer.

It frequently happens, either that there is no church in the new settlements, or that it is situated at an inconvenient distance. It is, therefore, the custom to inter a deceased colonist in some retired spot of the land, which he had cleared and brought into cultivation. These spots are rendered more funereal and mournful, by the shade of the surrounding acacias. Small sequestered groves of these trees, protected by enclosures, are always selected to serve as tombs for the family of a colonist; and if the neighbouring district have been peopled by his descendants, respect, and friendly feeling for the memory of the patriarch, induce even remote members of the family, in succeeding generations, to leave testamentary instructions, that their bodies shall repose with those of their ancestors. These rural cemeteries, which are frequently met with in the plantations of individuals, have had their origin in this custom. I have seen one of them, that is situated on a promontory of the Hudson river, in which are buried the first settler and his wife, with all their succeeding generations since the year 1628.

Use to which the Acacia is applied in Lancaster County.

The fields in America are enclosed by posts

and rails. The former are six feet high, and are mortised to receive five rails: they are let into the ground at distances of eleven feet, and the five rails are tenoned and fitted to the posts. This serves as a defence against the cattle, but it is a troublesome and expensive mode of enclosing the fields. To obviate these disadvantages, the Pennsylvanian inhabitants of Lancaster county form their enclosures in the following manner. They surround the field with acacias, planted eleven feet apart; and, while they are still young, nail the five rails to the trees. They are thus left, till the trees have grown sufficiently large to admit of being mortised to the depth of two inches. The rails are then fitted into the mortise-holes; and the wounds heal over the tenons, a sort of callus or burr being formed, which tends to retain the rail in its place, and to add strength to this new species of enclosure. The whole work displays a very striking and rustic *coup d'œil*, evincing both thought and industry.

If we reflect upon the benefit that is produced by the shade, the roots, the wood, the leaves, and the flowers, as well as by the actual presence of the tree itself (taking, at the same time, into consideration, how young the country is, in which so many praiseworthy and fortunate experiments have been made); we are constrained to reverence the memory of those early cultivators, who set so laudable an example to

all other men. How many fields do we see rendered useless by the exhaustion of the soil ! How many plains abandoned by man and beast ! If the difference of soil and climate do not deceive me, I cannot but think, that the same cause would produce the same effect *here* : then, indeed, we might hope to see, in the course of a few years, our sandy plains enclosed, and divided into small pasture-fields by acacia-hedges ; and ornamented by the same beautiful trees, whose salutary and restorative shade would insensibly induce a new and verdant herbage to spring up, and cover the surface of the ground, while, at the same time, the trees, attracting by their foliage the humidity of the atmosphere, would cause it to descend in fertilizing dew.

Note of M. F. DE NEUCHATEAU, upon the Memoir of M. ST. JEAN DE CREVE CŒUR.

M. ST. JEAN DE CREVE CŒUR, the author of Letters of an American Planter, *Lettres d'un Cultivateur Americain*, writes with persuasive warmth of style. His American letters were, for a time, quite contagious. He painted the happy situation of the colonists in the united States in such glowing colours, that not a few of his European readers suffered themselves to be somewhat dazzled with the preference, which he gave to the young and rising towns of the new continent, over the ancient cities of Eu-

rope. The same tone of enthusiasm and eloquence is obvious, in the preceding Memoir upon the Robinia ; but, in this instance, it has been so appropriately applied, that its effects cannot fail to prove of great utility.

It may be objected, perhaps, that M. DE CREVE CŒUR is describing another soil and a different climate. This is certainly true ; but the tree which he extols is no stranger, either to our country or our soil. Almost all our trees were originally foreign to us, and have become gradually acclimatised, *acclimatés*. In this way we formerly acquired the peach and cherry among trees, and many other useful and salutary plants have by degrees been naturalized. There is no cause to prevent us from adopting all the methods used by the Americans, to make the robinia generally useful.

M. ST. JEAN DE CREVE CŒUR passes a just eulogy upon Turkey corn, *maize*. He believes that it is unknown in France, which proves, that he has not seen those districts of the republic, in which this valuable grain is extensively cultivated. I have some intention of giving a particular description of maize, and I believe that I am able to furnish some entirely new ideas upon this subject.

Many remarks might be made upon various passages of this memoir, which the perspicacity

of the reader will however render unnecessary. For instance, the author expresses much surprise, that he should be obliged to pay his laborers at the rate of a bushel of wheat per day. This word bushel is somewhat ambiguous. If it apply to a Paris bushel, that measure would amount to the twelfth part of a *septier*; and be equivalent to twenty pence (forty *sous*), when wheat is sold for one pound sterling for twelve bushels (*septier*): and this daily pay could not be exorbitant, in a country where hands are scarce; but it is probable that the author speaks of an English bushel, which weighs three times as much as that of Paris.

In the agricultural operations, described by M. ST. JEAN DE CREVE CŒUR, the following appear to me to be particularly worthy of recommendation. First, the plan of combining, in one plantation, trees of every size and growth required for all kinds of work, including those prepared expressly for knee-timber (*see page 90*); and secondly, the method of plaishing, by a cut carried half through the branches of the robinia, with the intention to form impenetrable hedges (*see page 91*).

No. IV.

Articles upon the various Species of Acacia, extracted from the Dictionnaire du Jardinier Français, par M. FILASSIER, in 8vo, tome 1.

The White Acacia, or False Acacia—Carob-Tree of America.

THE *true* acacia (a tree so named on account of its spines, from a Greek verb which signifies to pierce or prick) grows in Egypt, and will not succeed in our colder climates. As the foliage of the American carob has some faint resemblance to that of the acacia of Egypt, and in common with it is also armed with very sharp spines, the nomenclators, to whom it was first known, concluded that they might give it the same denomination; but such obvious differences were soon observed, that the two could no longer be confounded; and the latter received the name of false, or *pseudo*, acacia.*

The robinia forms the thirty-first genus, in the forty-second section of the tenth Linnæan

* The anecdote is here repeated of the introduction of the tree by JEAN ROBIN: I have therefore omitted it.—*Translator*.

class, and the false acacia is the first species of that genus.

This tree possesses the greater interest, because it is not merely an object of ornament in our parks and pleasure-grounds. It not only grows with surprising rapidity, acquiring, in ten or twelve years, a greater height and bulk of timber than the oak at thirty or forty years of age; but it produces a very hard and almost imperishable wood, which, in its mature state, is extremely valuable to the artificer. An additional advantage is derived from the abundant foliage of the tree, which is very grateful to cattle, and more especially to cows. The flavour is that of saintfoin; and animals, which have become accustomed to it, prefer it to trefoil and lucerne. The roots extend to a great distance: they are branching, of a woody texture, and covered with a yellow-tinted bark, veined like liquorice-root, which it resembles in sweetness and other properties.

From the root rises a straight and vigorous stem, which, if the tree be planted in a soil suitable to its growth, will attain in a few years the height of thirty or forty feet. At an early period of its growth, the stem contains saccharine qualities: it is channelled, but gradually becomes more round, the projections changing into furrows of a clear brown colour, interspersed with spots of a deeper brown, which define

pretty regularly the dead green tint of the cuticle (*l'épiderme*). As the stem advances in growth, these dark spots become more conspicuous, enlarging transversely ; and the furrows are discoloured, assume a darker hue, and take a less perpendicular direction. At length, in old wood, they become mere blackish superficial roughnesses ; and those which retain their original colour, if seen from a distance, might be mistaken for unequal disruptions of the bark, if the touch were not to correct the misconceptions of the eye.

The young stem is furnished with alternate leaves, of a bright green colour, winged, and composed of eight, ten, and sometimes twelve pairs of lobes. The lobes are entire, oblong, more or less broad according to their situation, very narrow at the extremities of the branches, almost all of them being opposite, and terminated by a single lobe, which is rather more oval than the others. All are attached, by a very short footstalk (*pétiole*), to a long common stalk, which is provided with three channelled grooves, *cannelures*, enlarged and defended by two lateral and parallel thorns, at its point of insertion into the bark. All the lobes proceed from the prominences of the deepest of the channels, cut in the surface of the footstalk. By a peculiar mechanism, which appears to depend upon the transpiration excited by heat, these lobes quit their horizontal direction

and approach nearer to each other, their points turning upwards, as if to cover and protect their footstalk from the action of the sun's rays.

Just in proportion to the intensity of the solar light, do the upper surfaces of the leaflets approach to each other. They recede; as the heat of the day declines: towards evening, the leaves resume their horizontal position; and in the night, when the dew is falling, they turn downwards, and backwards under the *pétiole*, to enjoy the influences of the atmosphere, and repair the loss occasioned by transpiration. Sudden attacks of cold produce similar effects. From the axils of these leaves a branch proceeds, which, if the tree prosper, becomes in every respect like the parent-stem, producing leaves and secondary branches, in a semi-vertical position. These sustain their light and graceful foliage, hanging like numerous garlands, the whole forming a beautiful and majestic head, which is rarely surpassed, and would be unrivalled, were it not liable to be injured by the violence of the westerly winds. Towards the close of May, numerous clusters of white flowers are produced from the extremity of the buds, at the axils of two or three of the upper leaves of each branch. These flowers are papilionaceous, pendulous, and of a very agreeable odour: the germ of the flower becomes a pod, which is flat and oblong in figure, with several protuberances, and contains about eight kidney-

shaped seeds, of a deep brown colour. These become ripe during the course of November.

Propagation and Culture.

The false acacia may be propagated in two ways—either by its seeds or by its roots. In a bed of good, light, well-worked earth, having an eastern or northern aspect and shaded from the mid-day sun, the seeds are to be sown as soon as they are ripe (that is, in November), in drills, a foot apart from one another. The earth is then to be raked into the drills; and a sufficient quantity of dry leaves heaped upon the bed, to protect them from severe frosts. As all game, particularly rabbits, are very fond of seedling acacias, and will frequently devour the entire crop, they ought to be raised in such spots only, as can be effectually protected from their rapacity.

The greater part of the seeds will germinate in the course of the following spring, which would not be the case, if the operation of sowing were to be deferred to that season; and in order to accelerate their vegetation, it will be advisable to water the rows, two or three times a week in March and April, if the season be dry.

During the two first years of their growth, it will be sufficient to hoe the soil, and move it

about the roots of the plants carefully with a grubbing axe ;* after which, it should be drawn towards each line of plants : thus a furrow will be left between the rows, which will be of use to retain the moisture, not only of the waterings that ought to be given seven or eight times during the summer, but that also of the rain, which is of still greater utility.

At the beginning of the second April from the time when the seeds were sown, the young trees should be planted in rows, into thoroughly worked and substantial soil. The rows should be two feet asunder, and the plants ought to stand eighteen inches apart. They are to be copiously watered once at the time of planting ; and after the soil has been raked smooth, it is to be covered with half-decayed leaves, or dry litter, to preserve them from the burning heat of the sun. The future culture will consist, in merely moving the soil, every two months, with a double-toothed hoe (*serfouette à crochet*). Nature will effect the rest.

Towards the end of February, in the third year, the nursery-ground is to be digged with a small spade ; and the plants are to be cut down to within one inch of the surface of the soil,

* I know not how otherwise to describe a tool, which I imagine we do not possess (*serfouette à une dent*), and which I cannot trace in any dictionary.—*Translator*.

which is then to be made level, and covered with litter as before.

At the end of the June following, one only of the branches on each tree (and that the straightest and most vigorous) is to be left; and all the side-shoots growing upon that are to be left entire. This single shoot often grows ten or twelve feet by the end of autumn. The lower branches are to be taken off during the winter, and three or four only of the upper ones are to be left, to form the head; and these are to be reduced to half their length, at the end of February.

In the following year, the fourth of their vegetation, the trees may be planted out in the places where they are to remain. If the soil be fresh and naturally moist, the month of March will be a proper season for the work of transplantation; but if it be dry, and the soil of but a medium quality, the operation should be deferred till the succeeding fall of the leaf.

The pseudo acacia is very brittle; therefore, whenever it is intended that the tree should preserve its form, the long shoots which it sends out should be annually shortened to half their length. The lower branches ought to be taken off close to the main stem, if the tree is to be formed into a tall standard.

In general, it will not be advisable to permit this tree to become old. When aged, it loses its beauty ; and, even at twenty years, it retains but few appearances of that grace and elegance, which characterise its youth : but it is at that period that its wood attains the state of maturity, in which it may be advantageously employed.

The robinia will do well, and be an object of interest, in whatever situation it may be planted. It will add perfume to the vernal beauty of the shrubbery, or be an embellishment to clumps of lofty trees. As a solitary tree, it will lift its princely head above the flowering shrubs that may surround it ; and, when placed in rows, it will form an avenue delightful to more than one of the senses.

The tree may be multiplied by the roots in two different ways. If a tree, whose roots are to be thus treated, be standing alone, and if it have attained the age of ten or twelve years, it is to have a trench dug round it, in the month of March, three feet from the bole, till the roots are visible. This trench is to be kept open, and the ends of the roots left exposed to the influence of the air, which will cause them, even during the same year, to send up a number of scions, of various lengths. These are to be supported by props. In the early part of September, the trench is to be filled up, and left till the

end of the following March. At that time the scions are to be removed, with whatever roots are attached, taking care not to injure those of the parent-tree. They are then to be planted in a nursery, and treated as if they were seedlings; that is, to be headed down in the second year after being set out, and to be finally removed after the fourth autumn.

If the soil, in which the parent-trees are growing, be in good condition, their roots may, by a similar mode of treatment, be made to yield a considerable number of suckers for several succeeding years.

The other method of radical propagation consists, in leaving in the ground one third part of the roots of a strong tree that is being transplanted. The hole, from which the tree is taken, is not to be filled up, and the extremities of the roots are to be covered with earth, to the depth of one or two inches. So exposed, each root will send up a scion, which is to be treated in the way above described.

The roots, indeed, are so very productive of suckers, that if pieces of them, about six inches long and one inch in circumference, be planted in pots about eight inches wide (such as are used for cockscombs or balsams),* and the pots

* I venture to infer this meaning of the original term, *pots à ama-*

placed in a gentle degree of warmth under shade ; a number of young shoots will be produced, which, if treated according to the foregoing directions, will not fail to become trees, of equal worth and beauty with those which are grown in the usual manner.

Although the acacia is by no means fastidious in its choice of soil, it nevertheless prefers one that is naturally light, and that readily absorbs as well as retains moisture.

*The Rose Acacia,** ROBINIA HISPIDA : *the third of the genus Robinia, according to LINNÆUS.*

Recent writers on gardening have incorrectly styled this shrub (which is a native of Carolina), *the Chinese acacia*. It is much more fragile than the American carob-tree, *robinia pseudo acacia*, and rises to a less height, even in its native country ; while, in our climate, it requires the protection of a wall (upon which it is very ornamental), or to be supported by a strong prop, which will secure it from being broken by the winds, and at the same time, enable it to as-

ranthe, because it is in pots of the size above referred to, that these plants are finally placed for flowering.—*Translator.*

* *Robinia hispida*, rose acacia, a deciduous shrub, about ten feet growth, native of Carolina, whence it was brought in 1743, according to LONDON'S *Hortus Britannicus* of which there are two varieties, the common *hispid*, and the *rosca*, or upright growing.—*Translator.*

sume a pyramidal growth. Its leaves, like those of the pseudo acacia, are pinnated, with an odd or terminal lobe ; but the leaflets are less numerous, larger, and rounded. They are affected in a similar manner by heat ; and move, more or less, in proportion to the temperature. Their common footstalk is swollen at the point of insertion into the bark, but is not armed with two lateral spines. The channels in the stalk are not strongly marked, and the young wood is neither furrowed nor thorny ; but that, from which it proceeds, is bristled with a multitude of small, soft, brown, deciduous, hairy processes, which somewhat resemble those that clothe the buds of a few species of the rose, but are less prickly.

The tree is chiefly admired for its clusters of beautiful rose-coloured flowers. They are scentless, but exceedingly elegant ; and the tree, even in its early growth, produces numerous blossoms in the spring, and frequently a second crop in autumn, as if to compensate for its total sterility. The tree may be multiplied by layers ; but to effect this operation of layering, great care, skill, and patience are required. A more expeditious mode is, either to cleft-graft it upon the white or pseudo acacia, in the beginning of April, or to bud it upon the same stock in the course of August. It will be requisite to support the shoot carefully, when the bud pushes ; for the junction

of the two woods, being never complete, they are very liable to be separated.

It is advisable to plant these trees, with the grafted parts five or six inches below the soil, as eventually they will take root, and the trees be more secure from injury; but to effect this, they must be worked very low, and in every case will require the defence of a wall or the support of a stake.

This robinia, in common with the pseudo acacia, prefers a light and humid soil; and in order that their full beauty may be enjoyed, they should be planted in situations, where they will receive but two or three hours sun in the course of the day. They may thus be made to adorn shady spots, that would probably be found unpropitious to more useful, though less ornamental plants; and the pleasure-ground will then present objects of thriving luxuriance, instead of others of languid growth and unhealthy appearance (*ils offriront la riante image de la fécondité, ou les autres ne montreraient que le hideux spectacle de la langueur et de la décrépitude*).*

* The translation of this sentence is very free; but is perhaps better suited to the English ear, than if it had kept more closely to the florid language of the original passage. The whole of the article of M. FILASSIER (unlike that of M. DE CREVE CŒUR), is written in an exceedingly cramp and involved style, sometimes florid, and abounding with idiomatic quaintnesses, that can be with difficulty rendered into readable English.—*Translator.*

ACACIA CARAGANA—*Tree Aspalathus—Yellow-flowering Acacia—Acacia of Siberia—ROBINIA CARAGANA, sixteenth Species of the Linnean Genus, Robinia.**

This tree attains the height of from fifteen to twenty feet. It is not so handsome as the preceding trees. Its winged leaves, of eight or ten lobes, are arranged without order, and have nothing striking in their appearance; still, the long branches which it throws out laterally from the stem, adorned with inodorous yellow flowers towards the end of May, render it worthy to be admitted among other spring-flowering trees, in clumps and shrubberies. If the season prove rather moist, and the tree be planted in a shady situation, the blossoms will set and produce oblong conical pods, each containing three or four seeds, which will ripen about the middle of September.

* Now *Caragana arborescens*—the common Siberian pea-tree—deciduous, grows to fifteen feet in height, leaves in pairs, petioles without thorns. Introduced (according to the *Hortus Britannicus*) from Siberia in 1752. The term caragana is derived from the name of the tree in Tartary, “*carachana*.”—*Translator*.

Golden Acacia, of Tartary—Large-leaved Aspalathus—ROBINIA FRUTESCENS of LINNÆUS, the eighth Species of the Genus Robinia,*

Grows to about half the height of the caragana: still, they may be planted with advantage together. The stem, which seldom rises higher than eight or ten feet, sends out many branches, the extremities of which turn upwards. The bark is almost smooth, and nearly of a gold colour. Its leaves are larger than those of the caragana: they are supported by a short footstalk, and are composed of two pairs of lobes, the points of which are oval. From the joints of the branches, the flowers are produced in May: these are leguminous, yellow, scentless, and fastened by simple footstalks: they produce four or five seeds, which ripen in the beginning of September.

* Now, *caragana frutescens*—frutescent or shrubby caragana—introduced in 1752. In the *Hortus Britannicus* its height is stated to be two feet.—*Translator.*

Dwarf Acacia of Siberia—Little Tree Aspalathus—ROBINIA PYGMÆA of LINNÆUS. A new Species of Robinia.*

This is a small and delicate shrub, growing to the height of three or four feet only; but as it succeeds well in shady situations, and comes into flower at the end of April, it may be useful to fill up vacancies, and to decorate the front ranks of shrubberies. It has a smooth, light bark: its leaves are sessile, composed of oblong lobes: the flowers are produced from the axils of these leaves, are yellow, without scent, and fixed by a very simple footstalk. The seeds of this shrub ripen with less certainty than those of the two preceding species. The three shrubs last named may be increased, like the pseudo acacia, by their roots. This is the simplest method of proceeding, when the tree is found to be merely an object of ornament, and unproductive of mature seed; but when seeds can be obtained, it will always be advisable to propagate from them. They are to be sown in a shady situation, as soon as they are ripe.

The seedlings are to be treated like those of the false acacia; but, being of more tardy growth, they should not be transplanted into

* Now, *caragana pygmæa*—dwarf or pigmy caragana—from Siberia in 1751, stated as rising to one foot only.—*Translator.*

nursery-beds, until after the second year; then, in the month of March, they are to be planted out in rows, a foot apart every way, upon a level piece of ground (*plate-bande*) with a northern aspect, or, at all events, well protected from the mid-day sun. They should be watered immediately, as well as occasionally afterwards if the season be dry, and covered with leaves or litter, to protect them from extreme heat. In order to gain strength, they must be left undisturbed in these nursery-beds for two or three years; and the future culture will be restricted to keeping them free from weeds, and lightly digging the soil two or three times every year. When they are five or six years old, they are to be finally transplanted with great caution, as the roots take fast hold of the ground, and are easily broken.

These three species require a light and naturally cool soil, and should have but little sun. As a matter of choice, among the three, the preference should be given to the caragana, on account of its superior height and more graceful appearance.

*Three-thorned Acacia—Acacia of the Passion—
American Honey-Locust—Carouge or Carob
—GLEDITSIA TRIACANTHOS, the first Species
of the Genus, in the second Division of the
twenty-third Class of LINNÆUS.**

This beautiful tree is frequently styled *triacanthos* only: a Greek word, which implies that it has three thorns.

It is more hardy and less liable to injury than the pseudo acacia, and, like that tree, grows to the height of thirty or forty feet. The stem occasionally attains the circumference of three feet, and, as the wood is very hard, it is useful for many purposes of manufacture; but, when young, is liable to become worm-eaten. The bark is of a deep green colour, approaching to black in old trees: on the shoots of the year, it has a golden tint highly polished, and is interspersed with fawn-coloured spots, with, at intervals, veins of a silvery hue. From this bark proceed three exceedingly sharp and highly polished thorns, which are the more inconvenient, in consequence of being themselves armed with shorter, and equally piercing prickles. These secondary spines are occasionally placed oppo-

* *Gleditsia* is incorrect, or a corruption of *Gleditschia*, a name derived from that of a botanist of Leipsic, JOHN GOTLIEB GLEDITSCH. The tree has been known in England, for more than one hundred and thirty years: it is a native of North America.—*Translator*.

site to each other, upon the main thorn ; and they thus, by their relative situation, present the appearance of a small and pretty regular cross : hence the tree is styled by some of our nursery-men, “ *The Acacia of the Passion.*”

These lateral spines are frequently placed in alternate order, upon the principal thorn : sometimes but one secondary point is found, and sometimes it is wholly deficient : in the last instance, however, the chief thorn is stronger, more pointed, and prominent. It might readily be conceived to be a projecting weapon of defence, bestowed by nature, to resist the temerity of those, who, delighted by the beauty of the foliage, might be tempted to rifle the tree of this ornament. When the thorns are first produced upon the young wood, they are slender and flexible ; but they become very long, stout, and exceedingly acute upon the old wood, with the colour of which, their own rich morone tint forms an agreeable contrast. From the first-formed spines, others are developed, which in their turn produce a third set ; and the whole, thus associated, become clusters of thorns, having a slight inclination downwards, forming a defence along the whole length of the stem. This is the more remarkable, as it appears to be by no means required for a tree so robust in its nature ; and which is also so well protected by spines, emerging even from the sprouting buds. It is possible, that, in its native country, these

chevaux de frise may serve as a defence for little unarmed animals, which may find, in this tree, an inaccessible refuge from the attacks of their more powerful assailants.

The stem of the triacanthos is furnished with long alternate branches, which are covered, about the middle of May, with leaves of a lovely and brilliant green, possessing the same property with the robinia, of expanding and contracting, according to the degree of temperature.* They are winged, composed of several subsidiary wings, which are themselves formed of ten or twelve pairs of oblong lobes, terminating in points, their edges dentated, but in so slight a degree as scarcely to be perceived.† The

* This faculty (if it may be so styled), evinced by many of the papilionaceous plants, is one of very great interest. It is exemplified remarkably by the *erythrina crista galli*, the three lobes of which assume actually a vertical direction at noon-day, and one diametrically the opposite during the night. The phenomenon is a beautiful proof of the agency of *solar light*, and not, I suspect (as here supposed), of *heat* only, viewed more or less in connexion with the actual state of the plant. There is a time, even under the influence of day, when the leaves retain their horizontality undisturbed. While in an actively growing state, I have noticed the petioles to point perpendicularly upwards, for two hours before and after noon: then gradually to regain the horizontal direction; and, after sunset, to become depressed, till, in total darkness, they are bent downwards and backwards, till the points are directed to the ground. Close observation alone can determine, how far the leaves follow the relative situation of the sun.—*Translator*.

† Leaves so constituted are termed by botanists *doubly pinnated*, or

greater part of them are in alternate order, fixed to a partial footstalk, which proceeds from one larger, that is general or common to them all. This latter is slightly channelled on its surface, swelled at the point of insertion into the bark, and there defended by a spine on the upper surface, which protrudes at the same time with the leaf, and becomes visible shortly after it. A prettier foliage is not to be found: but it is entirely scentless; and therefore the author of the *Almanach du bon Jardinier*, and his copyist, have been incorrect, when they attributed perfume to the leaves of a tree, which nature has denied even to its flowers.

These blossoms are inconspicuous, and of a green tint: some of them are male, some female, and others hermaphrodite. They are produced in catkins, upon the young shoots, towards the middle of July. The perfect flowers are the fewest in number, and generally the most prolific; but the trees must be at least twenty years old, and the spring-seasons peculiarly favourable, otherwise they will not be fructiferous. In other respects, it is not correct to suppose that, among individuals of the same species, one tree cannot be fertilized, without

bi-pinnate. In these leaves, the principal petiole, or leaf-stalk, is winged with several pairs (in opposite or alternate order) of secondary petioles, whose leaflets are supported, like little wings, upon the two sides of their footstalks.—*Translator.*

the assistance of another. They each possess, independently, the faculty of producing ripe fruit; and the fact may be proved, by inspecting the numerous and superb gleditschias of Malesherbes,* where there is not a single instance of a tree, which has not afforded proof of having itself perfected the fertilization of its own seeds. The fertilized flowers are succeeded by pods (*siliques*), which are sometimes a foot and a half long, and about two inches round. When ripe, the pods become of a deep reddish brown tint; and contain seeds, somewhat like a kidney-bean, but neither so large nor plump.

* This chateau, the residence of a philosopher, is situated in the Gâtinais. It is not the elegance of its edifices that interests: they are too simple to suit the taste of our times; but the charm of the estate consists in its pleasure-grounds. In them are to be found, in all their beauty, trees of distant climes, so arranged, as to imitate their respective native countries. Here we might suppose ourselves in the forests of America, there upon the summit of mount Lebanon; and, further on, under the branching planes with which the ancient Romans shaded their fields: but when the owner of this beautiful domain is present, the illusion becomes complete—we are no longer at Malesherbes, but in the retreat of Fabricius.—*Note of M. FILASSIER.*

The subject of the above note, with the passage to which it is appended, are now obsolete: at best, uninteresting to the English reader. The description, however, is so picturesque, and the facts recorded afford so striking a proof of what may be effected by skill and assiduity, that I could not prevail upon myself to omit either the one or the other: my only regret is, that the translation fails to do justice to the beauty of the original, which, in the present instance, has lost its quaintness, and is really flowing and elegant.—*Translator.*

In favourable seasons, the seeds ripen about the period of the fall of the leaves.

Thornless Acacia—Acacia of Carolina—Water-Acacia—GLEDITSIA INERMIS, second Species of the Genus, according to LINNÆUS.

This tree is inferior to the preceding, in height as well as beauty : it differs from it, also, in having but few thorns, and these scarcely discernable. The young shoots, likewise, are less than those of the triacanthos, but still have a pleasing appearance. The flowers are inodorous, and have no beauty : they are followed by an oval seed-pod, containing but one seed.

Propagation and Culture.

These two species may be increased by their roots, like the acacia ; but the suckers advance more slowly, and must be left upon the parent-stock for two years, at the least. Trees may be more readily obtained by sowing the seeds.

As each seed is protected by a coriaceous testa, coated by an adhesive varnish which renders it impervious to moisture, the greater part of the seeds would remain two or three years in the ground, without germinating, if they were not previously prepared. To save

time, therefore, it will be proper to proceed in the following manner. Let the pods be opened at the end of April, and select those seeds only which appear full and plump, and of a dark fawn-colour: those which are flat, and blackish, and too small, as well as light in weight, are useless. Remove, with a sharp pen-knife, a small portion of the coating, on the round side of each seed. This will expose the kernel, without injuring it. Then sow the seeds in boxes, two feet wide, eighteen inches deep, and as long as may be required: these are to be filled with good substantial earth, but not too compact. Place the boxes in the shade, cover them with leaves or dry litter, water them moderately every other day, and, at the end of three weeks, the young plants will be seen. At the approach of winter, protect the boxes, by surrounding and covering them with a quantity of straw, securely fastened; and, at the end of April, plant the trees a foot apart, in a nursery, in rows two feet asunder. There they must be left to grow, for three years, without being cut down; but, in order to obtain a straight stem, the lower branches, at the end of July, are to be cut back to one foot, and the upper to six inches from their insertion into the stem. The future culture will be confined to hoeing the soil, digging it between the rows occasionally as required, and removing, before the trees shoot in the spring, all the branches that were shortened in the preceding year.

The gleditschias are not very nice as to the soil ; but they prefer one that is deep, cool, and moist, though not wet—substantial, but not compact.

Remarks of M. F. DE NEUFCHATEAU, upon the foregoing Articles, extracted from the Dictionnaire du Jardinier Français.

The seven preceding articles do not all refer to the robinia, so called ; but the trees and shrubs therein mentioned have some relation with that, which chiefly claims our attention. I have three observations to offer on these particulars.

1st. In the first article we remark, that the author recommends, that the seeds of the robinia be sown in autumn ; and that the seedlings be transplanted into nursery-beds, as well as into their permanent resting-places, in the spring only. I also have insisted upon the necessity of waiting till the rise of the year, to transplant the acacia ; nevertheless I must own, that M. MOREAU DE LA ROCHETTE and D'OLIBON, in whom I have the greatest confidence, are of opinion, that the tree may be planted to greater advantage before, than after winter ; and that, in this respect, the valuable tree under consideration does not differ from any others. The nursery-grounds of M. M. DE

LA ROCHETTE, and D'OLIBON, are situated on the banks of the Seine, above Melun, where the climate is milder than it is on the Moselle, where TSCHUDY wrote his work, and where I myself formed my first plantations. This circumstance may account for the different success which attends autumnal transplanting, in preference to that of spring, in various situations. The milder character of the winter at Melun, may authorise that mode of proceeding there, which might not be appropriate at Colombé, and in the Pays de Vosges, where the winters are very severe.

Colombé, near Metz, is the name of a superb estate planted by M. TSCHUDY. I went to see it in 1789, and had no reason to regret my visit. In no place have I seen pines, spruce firs (*épicéas*), and other evergreens, in such perfection. The robinias also appeared to me to be extremely beautiful.

Experience only will determine, whether these trees may be planted with equal success in autumn as in spring; and if the fact be ascertained, a year will be gained, which is of importance in a tree that grows so rapidly.

2nd. The *robinia hispida*—rose acacia—is the subject of M. FILASSIER's second article. This is merely a charming shrub, but has much less of a rural character than our acacia.

3rd. The caragana must be the Siberian acacia, or pea-tree of Russia. M. ECKLEBEN, superintendant of the Empress of Russia's gardens, had acquired, at that period, a degree of fame by the culture of the tree, the fruit or peas of which are very nutritious, for man as well as animals. They are dressed in a variety of ways; and not only bread, but even *omelets*, are made of them.

The seeds of the caragana may be sown in the same manner as peas, but in number, not more than as one of the former to thirty of the latter. M. ECKLEBEN asserts, that, in six years after planting, these trees may be made to yield a perpetual harvest for the sustenance of man and animals. Unfortunately, however, these astonishing facts cannot be proved in France, where the robinia caragana is as yet neither common nor acclimated. The tree certainly merits attention, and ought to be increased: it has sufficiently the character of a forest-tree (*assez rustique*), is not thorned like the robinia, and its leaves and pods might prove useful in domestic economy. Should this tree become common among us, we shall be indebted for the introduction of a useful table-vegetable, to those lovers of botany, who sowed and cultivated it from motives of curiosity. Ornamental gardens, and stoves of amateurs, thus become the *dépôts*, whence agriculture derives advantages. A thousand unpro-

fitable experiments are amply repaid, by the accession and dissemination of one species of plant, capable of adding to the enjoyment, or supplying the wants of mankind.

Agriculturists are deeply indebted to botanists ; and ought to consider *Le Jardin des Plantes*, as the magazine of their resources, and the universal *dépôt* of the vegetable kingdom.

The aspalathus, and other leguminous trees, may probably, at some future period, compete in utility with the robinia. That genus comprises, indeed, several species, which are suitable to hot countries ; and might prove equally valuable to the colonies of Guyana and the Antilles, as the robinia has been to the forests of Europe.

The *black wood*, so often mentioned by the zealous COSSIGNY, in his Memoirs for the Restoration and Amelioration of the Colonies, proves to the inhabitants, that they possess in that species of tree, all the advantages which we reap from the rapid growth of the robinia, and from the valuable qualities of its leaves and wood.

How many treasures remain still unrevealed in our noble garden of natural history ! and how obviously advantageous it would be, to extend its correspondence with similar establishments, not only in France, but throughout the four

quarters of the globe! We should remember, that the coffee-tree was introduced originally from Arabia into the *Jardin des Plantes*, and thence it has covered and enriched the mountains and colonies of America; while in France, the inhabitants of the mountains of Vosges and Auvergne, are, in their turn, nourished by a species of solanum,* a native of America.

* This refers to the potatoe—*solanum tuberosum*—*pentandria monogynia* of LINNÆUS, and of the natural order *solanææ*, a native of Peru.—*Translator.*

No. V.

On the Utility of the Acacia Robinia, and its Culture, by M. DETTMAR BASSE, Member of the free Agricultural Society in the Department of the Seine and Oise. Dedicated to Agriculturists.

SEPARATELY considered, this article, with the German authorities which are referred to and extracted from, are of considerable interest ; but, as the subjects which they comprise have been treated by the preceding writers at length, and no new matter is added, the translator thought it needless to burthen the English reader with useless and uninstrucive repetitions. The only fact, which need be retained, is a detail of an experiment by M. DETTMAR BASSE, as it tends to evince the certainty of success from sowing the seeds.

He says—As I had acquired some information concerning the interesting properties of this acacia, I determined, two years since, to sow nine pounds of the seeds, which I had chiefly raised myself, on an estate that I possess at the distance of four leagues from Paris. I had every reason to be satisfied with the results. My acacias were sown in May (*Floreal*), and had,

in September, grown to the height of three or four feet. In the present year, I have planted out ten or twelve thousand of these seedlings; and though the ground is very stony, they have more than realized my hopes: the plants, now only eighteen months old, are from seven to ten feet high. Others, from seeds sown during the present year, are already three or four feet in height; and I shall have great pleasure in exhibiting them to persons of taste in horticulture.

M. DETTMAR BASSE quotes, in the first place, Miller's Universal Gardener's Dictionary (*Millers Allgemeines Garten Lexicon*, 1768). From this extract, the reader can obtain no particular instruction of moment.

The next authority is that of a German author, date 1770, entitled, *Krohne Nachricht von der Acacia*. The only observation that need be extracted is the following. Winter-sown seed rises earlier, by fifteen days, than that which is sown in the spring; nevertheless, I have observed, that young trees, of the March sowing, have been in no way surpassed by those which have been raised from seeds sown in the autumn; and, at the end of two years, both are equally strong: therefore, it is of little consequence which of the two seasons may be chosen. I have seen trees of fifty or sixty years standing, which measured from twenty-four to thirty-four

inches in diameter, and from thirty-six to forty feet in height.

Another German publication, entitled *Du-roy Baumzacht*, contains nothing important, excepting the following observations on the extraordinary heat afforded by acacia wood. Not one among our native trees is capable of growing with such a degree of rapidity; therefore, the culture of the acacia must prove extremely useful, in those districts where fuel is scarce, because its wood is found to give out a much greater heat during combustion, than that of any other tree with which we are acquainted. This fact had been experimentally ascertained, by burning an equal quantity of acacia and elm-branches, when it was found that the former always produced a greater heat than the latter. The following circumstance led to the discovery originally. Permission having been given to some poor peasants, to collect the dead branches of the acacia, they heated their ovens with this fuel, which became so intensely hot, that they were obliged to let the ovens cool, in order to prevent the bread from being totally burnt up.

Menchs Verzeignis der Auslaendischen Baeume, 1735. Though the acacia is an inhabitant of the hot countries of North America, its culture is extended to the forty-third degree of north latitude. Indeed, between the thirty-ninth and

forty-third degree, the tree succeeds perfectly, and suffers no deterioration. Its growth is rapid, the stems of the trees are straight, the quality of the wood excellent, and it is highly valued.

When trees are raised from seed, and are thickly planted, they rise with straight stems, to the height of from sixty to eighty feet, and the trunks measure two or three feet in diameter. Rooted suckers, taken up and transplanted, produce trees of a good size; but they never attain the altitude of those, that are cultivated in the manner first mentioned.

The acacia has no principal (*tap*) root,* but is furnished with many strong secondary roots, which, in a light soil, extend laterally, one or two feet below the surface, and throw out numerous rootlets. These radicles appear to derive their nourishment from the earth below them, rather than from the surface-soil; because, neither herbage nor shrubs, that may be growing above these roots, are ever found to sustain injury.

An extract from a work by EHRHART, in 1787, succeeds, and contains no remarks of interest. The author's aim is to prove the excel-

* This is true with respect to suckers, but seedling acacias have a tap-root.

lence of the wood, as respects its hardness and strength, as well as its applicability to works of joinery and cabinet-making, and its particular utility as fire-wood.

In the extract which follows, from a paper by **BURGSORFF**, the author of several valuable works on the management of forests, there is nothing either new or interesting to the reader; unless it be found in the following passage, concerning the season for planting the acacia: but that, perhaps, may refer chiefly to Germany, where the winters are more severe than they are in general in the British Isles. He says, that the spring-season ought always to be chosen for the work of transplantation, because, if the trees be put out in the autumn, they usually suffer much from the severe cold of the winter. The author dwells upon the merit of the wood as fuel.

M. DETTMAR BASSE adduces two other extracts. The first is from the same writer, **BURGSORFF**, and is entitled, *Method of cultivating Acacias* by **BURGSORFF**. "The seed of this estimable tree, must be steeped in water for three days, then dried, and sown in shallow straight drills, covering the seed with earth a quarter of an inch deep. The rows are to be gently watered, if the season prove dry; and, being thus attended to, the young plants will soon appear, and will have time to grow large,

and acquire strength, before the cold weather set in. During spring, the plants are to be kept moist, to assist their growth, but afterwards watering will not be required. The trees are to be transplanted, before the opening of the buds in the succeeding spring, into a nursery (selecting the lowest spot), where they are to be placed one foot apart from each other. In a few years the acacias will be very strong, and may be planted out in the situations where they are finally to remain."

The remaining authority is entitled, HUMPHREY MARSHALL BESCHREIBUNG *Wildwachsender Baeume*, 1788.

This author praises the acacia for its numerous valuable qualities, and particularly notices its excellence for fire-wood. He states, that the tree will adapt itself to and prosper in the poorest and most sandy soils, repeating the substance of what has been so frequently advanced on this subject by previous writers, and adding nothing of moment to their opinions. He adduces several instances of rapid and vigorous growth in the vicinity of Hanover: one, upon the authority of DR. DUROY, of yearling branches, which grew from half an inch to an inch in substance. The observations which follow, although not absolutely new, are nevertheless worthy of attention.

“ When an acacia is raised from seed, it sends up a straight stem, without producing suckers from its roots : but when the tree has been cut down to the ground, it throws out as many suckers as there are lateral roots, (*tant de rejetons que ses racines s’étendent*) ; and these suckers, when planted out, possess similar powers. The cultivator, therefore, ought to pay particular attention to the difference noticed above : for if suckers were to be employed in the formation of avenues, or to be planted before dwelling-houses, in court-yards, fields, or meadows, they would do much injury ; whereas, if it were the intention of the planter to obtain a large supply of fire-wood, vine-props, hop-poles, and other useful articles, it would be to his interest to plant rooted suckers, because, in eight years time, he might cut over the plantation, which would subsequently require no further attention.

“ The branches, also, may be cut in the manner of an osier-bed, at any height ; and this quality of the tree greatly enhances its value. These cuttings may be repeated every three or four years, without injuring the trunks, which become neither hollow nor unsound : indeed they are found, on the contrary, to acquire strength and solidity ; so that, after ten or eleven years, they will have attained sufficient size to be sawed out, into planks of ten or twelve inches width.” As the note of M. DE NEUFCHATEAU, upon the preceding article by M. DETTMAR

BASSE, alludes altogether to the authors from whom he has made extracts, and as it in no way relates to the culture or qualities of the robinia, it has been considered needless to translate it.

No. VI.

Analytical Report, made by A. D. J. B. CHALLAN, in the name of the Commission of Woods, Plantations, Orchards, and Nurseries, charged with the Examination of a Work by Citoyen DETTMAR BASSE, entitled, On the Utility and Culture of the Acacia. (Société d'Agriculture de Seine et Oise, 25 Nivôse, an 9.

THE early pages of this report comprise little more than a recapitulation of the work of M. DETTMAR BASSE: they are, therefore, not translated. M. CHALLAN, after having thus repeated the substance of that which has been noticed, proceeds to comment upon the work, and the experiments recited in it.

Some of the remarks are very interesting. He observes—"From what has been already detailed, we are in possession of every fact connected with the growth and culture of the robinia. It remains, then, to consider the produce of the tree, and the purposes to which it may be applied, either as timber for building, for cabinet and turnery wood, or finally for fuel.

"It is unquestionable, that the solidity of any

wood is in proportion to its weight, and hardness of texture. In these two qualities, the acacia takes a station between the oak and the elm ; our two most valuable forest-trees in this department (*Seine et Oise*)."

" The wood of the acacia appears to be harder than that of the oak, in consequence of its possessing a smaller number of fibres than the latter tree : and as it has but a minute proportion of alburnum, or sap-wood (*aubier*), it is not liable to be worm-eaten ; especially when the bark has been removed, which, indeed, is very subject to decay.

" Boston, the first city which the English built themselves in New England, is almost entirely constructed of acacia ; and the timbers are in nearly as perfect a state now, as if they were new. There is reason, however, to believe, that as the wood is not elastic, joists and beams which are made of it, would be unable to support an equal weight and pressure with those of oak ; yet this inconvenience would prove an obstacle to the use of acacia-wood in monuments and other great erections only, and it might be obviated by the mechanical skill and science of the architect.*

* It appears, by experiments lately made in our dock-yards and in France, the results of which will appear in the course of this work, that M. CHALLAN is in error as to the strength and elasticity of this wood.—
Note by the author.

“ The tree is peculiarly valuable to the cabinet-maker, because, at twenty-five or thirty years' growth, it produces planks a foot wide, which, as has been remarked, have little or no sap-wood.

“ When first worked, the colour of the acacia is yellow, spotted with green : this in time assumes a brown hue, which has a pleasing effect in furniture.

“ It is peculiarly adapted to turnery-work ; for as the wood is of very hard texture, and its grain close and fine, it is capable of taking a very high polish. Excellent castors, mortars for culinary and medicinal purposes, tobacco-boxes, and a variety of turnery-wares are made of it. It is not the trunk of the tree only that may be turned to advantage : M. BASSE adduces authorities to prove, that poles and props may be made from the branches, which remain in the ground without alteration or decay for many years. The quality attributed to the wood, of being insusceptible of injury from moisture, has induced many persons to consider it a substitute for the oak, in the formation of piles, water-courses, and other under-ground works ; but it must not be concealed, that this opinion is in direct opposition to that of the celebrated DU HAMEL, who expressly says, that the wood of the pseudo acacia readily decays in moist situations. I have myself proved the truth of his

assertion; for the ground which I possess is subject to frequent inundations, and I have distinctly perceived, that the acacia-posts, which I had put down, speedily decayed; that the age of the trees, or the season of their fall, has made no difference in this respect; and that young wood, in the vigour of its growth, has perished with equal certainty.

“The smaller branches, fragments of the stem, &c. are to be used as fire-wood; and for this purpose they will be found greatly superior to elm, which is, notwithstanding, admirable fuel. The author, M. DETTMAR BASSE, mentions the accidental discovery of the heating quality of the acacia-wood (*see page 128*); and it is worthy of remark, that *dead wood never produces so much heat, as that which is cut from living and healthy trees*. Nevertheless, the dead branches of the robinia were found to produce an intense degree of heat: whence it is evident, that a considerable profit might be derived from it, if it were converted to charcoal; and that the cultivation of the tree, for this purpose, should be adopted, in preference to that of the soft-wooded trees, which are so often employed by charcoal burners.”

The succeeding paragraph in the original refers wholly to the report of the commission, appointed to investigate the work of M. DETTMAR:

it is now of little interest. After speaking in commendatory terms, generally, of the plans and proposals of the writer, the reporter adds—“It is in exposed and sandy plains especially, that the experiment of forming plantations should be made: they would be found to protect the soil from the great power of the sun, would prove attractive agents to the rain and dew, and thus enrich the surface of the ground with a new and luxuriant vegetation.”

The few remaining lines of this report, and a *programme* of a premium offered by the Society of Agriculture, for the culture of the acacia, are not translated; nor are the remarks upon this *programme* by M. DE NEUFCHATEAU. They are not deemed of moment to the English reader.

No. VII.

Observations in Favour of the Acacia of ROBIN,
by M. MULLER.

“IF the revolution,” observes this author, “have devastated the forests of France, war has produced equally disastrous effects in those of Germany. In that country, immense quantities of wood have been uselessly employed in erecting the Austrian fortifications. The magnitude of the evil has shown the necessity of a remedy, and recourse has been had to the acacia, plantations of which have been extended even into countries, that have not yet been afflicted with the scourge of war. Thus the axe of the Austrian has caused the successful cultivation of an American tree, which is as valuable of its kind to Europe, as is that excellent vegetable, the potatoe.”

M. MULLER then notices the work of M. DETTMAR BASSE, and the authorities quoted by him, to show the importance of cultivating the acacia: and he adds—“But in France, as elsewhere, able writing and excellent advice, on all subjects connected with rural economy, come with difficulty within the comprehension of simple agriculturists. They have no taste for read-

ing ; and if it happen that a book is placed in their hands, they appear as if predetermined to reject, as the idle reveries of theory, every thing that does not accord with their ordinary habits, or the customary practice handed down from their forefathers. It is only by the aid of facts, and positive results placed before their eyes, and by the experience of years, that their obstinacy and prejudices can be successfully overcome.* This fact, which cannot be controverted, ought to stimulate the landed interest, the clergy, and indeed every well-informed person residing in the country, to enter at once upon the culture of the acacia, to sow its seeds, to distribute the young plants, or, at least, to make

* This prejudice, or inaptitude, complained of by the French writer, is proverbial among us. It is surprising, that men of any profession should shun improvement ; but that this is the case is too obvious. Mankind, generally considered, are mentally indolent, and find it more easy to persist in the practice of that which has already succeeded, than to enter upon a course of experiments which must demand much energy, and may terminate in failure and disappointment. “ Let well alone,” is a trite, but in some cases very wise maxim, replete with meaning. Many plans, that have been highly lauded and recommended, have been founded upon fiction or suggested by deceit ; hence, caution is always required, and reflecting men will pause before they adopt. In agriculture, the science of chemistry might always accompany practice ; and as far as it has done so, undeniable improvement has been the *certain result*, although chemists, men inexperienced in practical husbandry, have theorised too much. But the light *has dawned* ; and if prejudice do not prove too strong for science and fact, *pure, liberal chemistry* will, ere long, effect more, than the uninitiated can by any possibility imagine.—*Translator.*

known the mode of propagation, as extensively as possible, and by every means in their power.”

Several paragraphs, referring wholly to M. DETTMAR, and his plantations at Villeginis, are omitted. M. MULLER then enters upon the consideration of some important points, connected with the subject of the acacia.

First, On the Complaints of the Despoliation of the Forests.

The leading observations, under this head, refer solely to the state of the forests in France during the revolution. They are, therefore, passed over. The writer urges the necessity of replanting the forests, “not only to afford shade and shelter to the fields, but to ameliorate the air, and the climate generally. It is well known that the exhalations from trees are favourable to all vegetation, to animals, and to mankind ; that trees attract atmospheric moisture, so requisite in cultivation ; that they afford protection from the violence of winds : in a word, it is sufficient to observe, that woods tend to purify corrupted air ; and therefore, as the acacia possesses this purifying quality in a pre-eminent degree, is beautiful in its general appearance, and perfumes the air with the fragrance of its blossoms, an entire forest of these trees would be a real benefit to the surrounding country.”

Second, The Acacia prospers in the poorest Soils.

“ I have seen, at Emmerichshof near Alzenau, in Mayence, a superb plantation of acacias, formed in a pure sandy soil, absolutely barren in quality, light too, and moveable as dust ; yet, notwithstanding these inconveniences, the soil has been consolidated by means of the roots of the acacias intersecting one another. The plantation has been surrounded by ditches and fences, to protect it from injury. The BARON BENZEL, who made this plantation, had all the young trees watered with liquid manure from dunghills, and the earth about their stems covered with mulch. He thus succeeded in fertilizing this wretched piece of ground so effectually, that, at the present day, it brings him in an annual revenue of 20,000 livres, which has amply repaid him for his outlay.”

Third, Acacia-Wood is applicable to every Purpose (usage).

The author repeats that which has been so often asserted—namely, the extreme value of the wood as an article of fuel ; and then adds—“ It may not be considered useless to observe, that the wood of the acacia, after the tree has been felled, becomes in a space of time varying from one to three months (according to the state of the weather as to moisture), so extremely hard,

that it cannot be split without the greatest difficulty, and the tools of the wood-cutters are frequently spoiled in the attempt. If, on the contrary, the acacia be cut up as soon as it is felled, fir itself is not worked with greater facility. It will be well to make arrangements in consequence.

“ The planting of woods to form lofty acacias (*en haute futaie*), for the express purpose of procuring fuel, is certainly an object of the greatest moment. The necessity for fire-wood is of importance, not only for domestic purposes, but also for that of carrying on many branches of manufacture, such as those of refined sugar and salt, the salt-works, tile-kilns, glass-works, porcelain-factories, potteries, &c. &c. Plantations, indeed, ought to be made in the vicinity of every factory, the success of which may depend chiefly upon a cheap and ready supply of fuel.*

The making of charcoal is another consideration of importance, connected with planting acacias for large standards. The ordinary

* The above remarks obviously apply to France, where wood constitutes the chief article of fuel: I have retained them, however, because they may tend to prove and impress the fact, that, wherever an article of importance in manufacture is required (be it what it may), it should be produced on the spot, or in the neighbourhood, if it be possible. I conceive that acacias, grown in the immediate vicinity of hop-gardens, would reduce the cost of hop-poles to less than one half.—*Translator*.

charcoal does not give out one-fourth part of the heat of that, which is prepared from this wood. The workmen at the iron-furnaces are well aware of this fact; for when they employ more than one quarter of the quantity, which is required when common charcoal is used, the iron is either burnt or oxidised (*brûlé ou calciné*).

“ Wood that is intended for charcoal, as well as for domestic fires, is obtained by cutting the trees every six or seven years. It is essential that plantations, intended for these purposes, should be laid out at their first formation, so as to admit of six or seven successive cuttings. When these are completed, the ground ought to be entirely cleared (*rasé*): not a tree nor shrub should be left, to interfere with or arrest the progress of the new shoots, that the stocks send forth. The truth of this observation is proved at Villeginis, where M. BASSE has suffered some full-grown acacias to remain, being unwilling to fell them. Under the shade of these trees, the young acacias, which shot up, although they grew, yet remained always weak, stunted, and languishing. Even the wood that is cut for use ought to be soon removed, and by no means allowed to remain on the spot later than the month of January: by that time the ground should be cleared, that nothing may interfere with the growth of the young wood.

“ It cannot be too often repeated, that it is a

peculiar quality of the robinia, to propagate itself: that is to say, as soon as the trees are once established, they yield so many plants from the roots, that after the first year a thick wood is formed, without further trouble on the part of the planter. He has, in fact, nothing more to do than to clear away the superfluous plants with the axe, so as to leave no more than the necessary number to furnish the succeeding cutting. This operation is to be renewed every year: the young offsets may be made into fagots, if they are not wanted for planting in other situations; and must prove particularly useful to brewers, bakers, pastry-cooks, &c., who would find it to their interest to burn them, in preference to fagots of any other kind of wood, because a much smaller quantity would be sufficient to heat their ovens.

“ The proprietor of six or seven acres (*arpents*)* of land, may safely undertake to cultivate the acacia: the produce of one acre only will prove amply sufficient for the household consumption.

“ A third object to be considered, in planting woods of tall acacias, is a supply of timber for building, flooring-boards, &c. The trees for

* *Arpent*, which the dictionaries render acre, contains, in fact, but five eighths of the acre English: therefore, four of the latter are nearly equivalent to six and a half *arpents*.—*Translator*.

these purposes must not be cut for ten years, and the plants ought, without exception, to be obtained from seed ; because, as rooted suckers have no tap-root, they cannot, in a shorter period, have obtained strength to produce wood of the required substance.

“ The late DUKE of DEUXPONTs kept up a small plantation of this tree, in the park which surrounded his chateau, named Carlsberg. It was made by his head-gardener, PETRI *le père*. This person showed me acacias, that were thirteen or fourteen years old, which measured more than eighty feet from the ground to their summits : the well-grown stems were perfectly straight, and were from twelve to sixteen inches in diameter. I examined these trees accurately, and am correct in my account of them. Several have been cut down, and the wood made use of for building-timber, and furniture of various descriptions, all of which are more beautiful than those that are made of walnut-wood, which is so much in request among joiners and cabinet-makers.

“ It would be an excellent speculation to grow timber of this description to be sawed into planks and boards. The space of ten years being required for its production, should be no cause of anxiety ; for are there not many enterprises, the completion of which must be calculated to require a much longer period ? The

plantation, when once formed, would cause no further trouble to the proprietor, than to see that it is annually cleared from all superfluous suckers. Every two, or rather three years, the lateral branches should be pruned off, and the heads of the trees cut, in order to procure strength of stem. This operation, far from being injurious, is indeed necessary, as it tends to promote the developement of the trunk. There will be also intermediate loppings, in the course of ten years, of sufficient value to repay all expenses of planting, &c.

“ We will now re-consider the facts which have been already noticed, and it will appear,

“ 1st, That there will be eight or nine small cuttings annually.

“ 2ndly, One to a greater extent every two or three years.

“ 3rdly, The general cutting, at the termination of the ten years.

“ Supposing, then, twelve thousand trees to have been planted in four acres (*arpents*) of land—at the end of ten years, every tree, without any exaggeration, will be worth five shillings (six *francs*); therefore, the sale of the whole number will bring a sum of three thousand pounds (seventy-two thousand *francs*).

This calculation is very moderate, and can be maintained upon good grounds ; because, among twelve thousand trees, there must be many which will produce, each, three, six, or eight planks, of from twelve to thirty feet in length, and which, one with another, may be worth the very moderate sum of two shillings and six pence. A number of the trees, therefore, will be worth 12*s.* 6*d.*, 15*s.*, or 20*s.* each ; and, thus, the sum total of the sale of the twelve thousand will be more than doubled. It will be observed, that there will be also, at every cutting, a vast quantity of fire-wood, fagots, loppings, chips, and fragments, which will assist to reduce the expenses, and compensate for any losses or pil-lage that may occur. It is evident, then, that the original calculation (seventy-two thousand *francs*) is not an exaggeration ; on the contrary, that it falls short of the actual return. I ask, then, what species of crop, or culture, could offer so many advantages, unless it be that of the orange-tree, which, however, not being adapted to our climate, might be destroyed by one night's frost. The acacia is not exposed to similar accidents : the winds, which are its only enemies, may break some of its boughs, and damage its trunk ; but the tree only flourishes and shoots with more vigour : indeed, one of its best qualities is, that no wound will destroy it.

“ After a plantation, then, has stood for ten

years, a most valuable stock of timber for building will be obtained. This wood improves by age, for it becomes hard just in proportion to its exposure to the influences of air and water : it may safely be affirmed, that it would remain sound for centuries. I once saw a bridge, the supporters of which, under water, were of acacia-wood. These had become harder than iron. I tried to detach a piece of the wood with an axe, but found it impossible—the edge of the tool was turned, without my having been able to accomplish my object.”

No remark of importance occurs in the French work for several pages, nothing that is interesting, or that has not been repeated more than once : we, therefore, pass on to the author's observations upon planting a wood of acacias. He says,

“ The work must be commenced in the small way, even when an extensive plantation is in contemplation. Nothing will be gained by prodigality in sowing the seeds, because the required number of hands could not be obtained ; or if it were, an enormous expense must be incurred to plant an entire forest, in the succeeding year after sowing. Nothing will be lost by small beginnings : on the contrary, it is the best method that could be pursued. By planting, in detail, a part of the wood every year, experience is acquired ; and the whole extent of

ground designed for the plantation becomes covered, by degrees, and almost insensibly. The cutting of the first planted portion will commence, by the time that the last part shall be completed.

“ Care must be taken to protect the young rising plants, while in an herbaceous state, from being devoured by snails, which, to my cost, I found to be enemies to the plant, for all my young seedlings were eaten by them. In order to protect the seed-bed from their depredations, it will be prudent to surround it with ashes ; and these should be renewed after every fall of rain. Rabbits, hares, sheep, and horned cattle, are equally to be guarded against.

“ The nursery for seedlings should be exposed to the sun, in an airy, open situation, far away from the shade of tall trees, which would prove injurious : it ought, however, to be protected from northerly winds.

“ No tall plants should be raised near the seed-bed, for the reason assigned with respect to trees.

“ Water must be given daily ; but if manure-water were applied, once or twice a month, the effects would be astonishing.

“ It is absolutely needful, at the approach of

autumn, to protect the bed from frost by a covering of dry leaves, which ought to be collected in the spring and summer, and dried in sheds and barns : they must be made perfectly dry, to prevent any injury the plants might otherwise receive from the humidity of the leaves.

“ At the time of transplantation, all the plants, without distinction, should be removed : I consider it quite useless to select the larger trees, and to leave the weaker for a time in the nursery.

Of the Manner of Planting.

“ A number of hands must of necessity be required to form a plantation ; but from twelve to fifteen thousand trees might be annually planted, by a few persons, without either much labour or difficulty. Ten men could easily transplant even fifty thousand trees, if the ground were in a state of readiness. The holes, indeed, ought to be prepared before-hand ; and every leisure opportunity, during the autumn and early part of the winter, should be employed in the work. It is most convenient to plant the trees in *quincunx*—six feet apart every way.

Precautions to be observed.

This writer mentions the circumstance, that the roots of the acacia extend to a great

distance ; as well as the fact so often insisted on, that at every wound, a sucker, that is, a rooted shoot (*rejeton*) is produced. He therefore cautions planters against the introduction of the tree into flower or fruit gardens ; and refers to the authority of M. MEDICUS, whose work will be again noticed.

“ Autumnal seed-sowing and planting,” it is added, “ will always be attended with danger from frost. I cannot recommend either. However, in warmer and more genial climates, it is possible that they may succeed ; but in these I have no experience.

Supplementary Observations.

“ Acacias are well adapted to form live hedges. They are planted at one foot apart, in a straight line. In the second year, the stems are bent down so as to cross each other ; and in this state are grafted together, leaving every tenth tree to rise as a standard. The tops of the other trees are thrust into the earth, in order to multiply the number of roots, and to thicken and add strength to the hedge. It will thus be rendered impenetrable in a few years. A branch or more may be grafted into each tenth tree, intended for a standard, without injury. These standards add much to the beauty of the work. A ditch must be made, on the outside of the hedge, to prevent the inroads

of cattle. No other attention or expense need be incurred. It will thicken, and become a defence as efficient as a wall."

Of the Ground best suited to the Growth of the Acacia.

This author, in common with previous writers, asserts that any soil, wet or dry, will agree with the tree ; but remarks, that in peaty soil it thrives with the greatest vigour. " A turbary or peat-bog (*la tourbe*) is its own peculiar bed. Therein its growth will be surprising (*il y fait des merveilles*)."

The remaining paragraph refers to France. The author urges his countrymen to plant their waste lands, even bogs and morasses, with acacias ; and assures them, that they will be amply remunerated, their country benefitted, and their climate rendered more salubrious.

No. VIII.

*Extracted from an English Work upon the
Acacia, in 2 vol. 8vo, 1796.*

THE author notices five species of the genus :
viz :

Robinia pseudo Acacia—common Robinia.

Hispida—Rose Acacia.

Caragana—Caragana.

Frutescens—Shrubby Acacia.

Pygmæa—Dwarf Acacia, now Caragana.

These have been already described in a preceding article by M. FILASSIER, *No 4, page 98* : it is therefore considered a useless repetition to add a translation of the entire article, especially as the remarks are not of material importance. The following observations, however, are selected. “ These species are frequently propagated by cuttings, many of which, if placed in moist ground in October, will strike root and grow. They ought to remain undisturbed for two years, at the expiration of which they may be transplanted ; though it is proper to add, of the fourth species, that it may remain longer in the first bed. As cuttings of this plant, the *robinia frutescens*, often fail, the most

certain method, if seed prove abortive, is to plant the offsets of the roots.”

Note of M. DE NEUFCHATEAU upon this last Article.

The assurance given in the above, that the robinia may be propagated by cuttings, in moist situations, is the most consequential circumstance that it contains. It has been seen, that M. FILASSIER recommends, that cuttings be placed in pots and beds ; which leads to the supposition, that success, by this method of propagation, is doubtful : it is therefore necessary, to ascertain the accuracy of the observation advanced by this English author.

The following information on this subject, which was communicated to me by MESSRS. MOREAU, is worthy of attention. At Belombre, near Melun, stood an acacia, which had been cut down close to the ground, because, in the situation which it occupied, it was found to be prejudicial : it was left on the spot. A strong forked post was required, to support the cross pieces of a cart-shed, which was to be erected ; and the stem of the acacia, which had remained a month after it was cut down, was employed for the purpose, and set up in the ground without any precaution, like a stake. Not a little surprise was excited, when the stem of the acacia was seen growing, and producing shoots, as

if it had been planted with roots entire. This prop is now a tree. It was, when cut down, about fifteen inches in circumference, and twelve feet high. Hence it may be concluded, that this tree may be propagated from cuttings and slips, as well as the poplar, willow, &c.

This new and ready method of propagating the robinia ought to be studied with the greatest care. Above all, it would be a most fortunate circumstance, could that truly estimable species, without thorns, *robinia inermis*, be raised from cuttings. An excellent opportunity is here offered to foresters: they, who shall have made decisive experiments on this point, will have deserved well of the agricultural part of society.

The author of this collection would be happy to make public the results of trials, which may have been induced by the perusal of his letter; and would feel himself amply recompensed, were he obliged to give a supplement to the work, for the express purpose of recording the facts which had been elicited on a subject, in every point of view of so much importance.

EXTRACTS

FROM A

LETTER UPON THE ROBINIA PSEUDO ACACIA,

ADDRESSED TO

M. F. DE NEUFCHATEAU

BY

F. C. MEDICUS.

THE name of this writer has frequently occurred in the preceding pages : his authority, indeed, upon the culture of the tree, is one of great weight ; but as this letter, although designed to form an appendix to the work of M. DE NEUFCHATEAU, contains but few passages of real importance on the culture of the robinia, it has been thought unnecessary to translate the whole of it. Nothing, however, is omitted, that could interest or instruct the English reader.

M. MEDICUS (*page* 3) remarks, that several of his own observations had, in the work of M. DE NEUFCHATEAU, been published under the name of another person.

At the fifth page, he enters upon the detail of an experiment made in 1791, in order to re-

fute an assertion, that the climate of Germany would not suit the culture of the acacia. He planted a small wood of trees, raised from seed, which succeeded admirably; but was shortly afterwards (1795) destroyed by the war, which, at that time, raged between the French and Austrians. In 1796, he recommenced his experiments, and planted an hundred perches (*un arpent*) of land.

Page 6. In 1795, M. MEDICUS began to publish his periodical work upon the robinia, which contains thirty-two numbers (*cahiers*); and he observes, that therein he had given the experiments of those individuals, who, partly in consequence of his writing and example, had been induced to cultivate the tree in other countries.

Page 7. It was from this work, that M. DETTMAR BASSE had taken the various extracts, that were printed in his memoir, which is referred to in No. 5 of the select articles, attached to M. DE NEUFCHATEAU's Letter. M. MEDICUS does not complain of this proceeding; he only regrets, that M. D. BASSE, instead of avowing his intention to make extracts from the work of M. MEDICUS in some future memoir, had not acknowledged that he had already done so. In several following pages, M. BASSE's experiments, on a large scale, at Villeginis, near Paris, are particularly mentioned.

Pages 12, 13. The writer notices the difficulties which attend the general introduction of the acacia, and have operated to bring it into disrepute. The same causes which proved inimical to the culture, in a former period, still continue in operation : " It is therefore a duty," he adds, " to make known what the impediments really are, in order to be able to remove them."

Page 14. " The first is the tenderness of the stem of young seedling acacias, and this continues for the first three months ; indeed, until the root (in which the principle of the future vigour of the tree lies concealed) has acquired a certain degree of strength. This delicacy of the young plant requires, not only particular attention, but renders it necessary to commence its cultivation in the best soil of the garden. The chief points to be attended to, are to keep the plants free from weeds, and the soil regularly watered ; for though nothing can be more injurious to the young tree than shade, and though it requires the full influence of the sun, its roots, nevertheless, delight in moisture. As the requisite attention to these particulars cannot be paid to acacias planted in a forest, sowings, made in such situations, are but so much labour and expense thrown away. It was well known to our foresters, that seeds, which fell naturally from trees in the woods, or were there sown by hand, produced forest-trees with the greatest

certainty: they, therefore, sowed the seed of the acacia in woods and forests; and as, after repeated experiments, patiently persisted in from time to time, it was found that the seeds invariably failed to germinate, their predilection was converted into dislike, and they proceeded to decry the tree. Most of the foresters of Germany, men of ability, are constant enemies of the acacia, simply because it differs from other trees, in as far as it will not germinate from self-sown seed. Even those among the foresters, who are friendly to this tree, notwithstanding advice to the contrary has been repeatedly given, still persist in their attempts to produce the acacia, by sowing the seeds in forests and woods; and when they perceive that every effort fails, they neglect and frequently become inimical to it.

“ The circumstance of the young acacias being so tender, cannot be too strongly enforced upon the attention of planters; for it is precisely this delicacy of the seedlings that forms the difficulty, or rather impossibility, of raising the trees from sowings effected in the usual manner. Unlike all others, the acacia must absolutely be raised in nurseries, and thence be transplanted to the spots where they are permanently to remain. This operation, it is true, is laborious and expensive; but if it be methodically attended to, the labour will be amply compensated in the long run.

“ The second obstacle, which opposes the cultivation of the tree, is its liability to be injured by high winds in exposed situations. The elegance of its foliage, and delightful odour of its blossoms, made it an appropriate ornament for gardens and public walks. In such situations, however, it was necessarily isolated and exposed to accident : hence it fell into discredit, and was abandoned. Every friend to his country, who wishes to encourage the cultivation of the acacia, should discountenance the planting of solitary trees as objects of ornament, the practice tending to injure and bring them into discredit. When, on the contrary, they are planted in masses, as in a forest, there is nothing to be apprehended.

“ During the two or three first years after transplantation, the heads of the taller trees, that rise above the others, may suffer ; but this circumstance will be of ultimate advantage, because the summits of the whole *mass* will thus be rendered level, and be more equally exposed to the influence of the sun, which is of importance in promoting the growth of the *heads* of the trees. All danger of injury will cease in a few years : at least, in the small wood which I planted, neither I nor my gardener have perceived any damage from winds ; although we have frequently observed the trees with surprise, under the influence of a hurricane, bending and leaning to one another for support with-

out breaking, and raising themselves continually but to be again forced down. The extreme flexibility of the acacia, so detrimental to it when planted singly, is precisely the quality that is so advantageous when in masses, where each may lean for support against a neighbouring tree: while the indigenous inhabitants of our forests, from their very inflexibility, are unable to resist the violence of the winds; and, as is too frequently seen, are torn up by the roots, producing extensive devastation.

“ In order to enjoy all the advantages that can be afforded by the acacia, planters should be aware of its peculiar habits. It must neither be planted out singly, nor transplanted into woods that are already formed, unless indeed the open spaces therein be of considerable extent, to admit of the uninterrupted sun-light, which the trees require to enable them to advance in height, and throw out shoots, with their natural rapidity and luxuriance.

“ The acacia should therefore be planted in small woods, without other trees; and the nearer these are formed to the spots which they are intended to supply with either fire-wood, or vine and other props, the more lucrative will they be found.

“ The quality of the soil is of minor importance: for though the tree will doubtless grow

with greater rapidity in good ground, it will also flourish in a poor and hungry soil better than any plant whatever; and at the same time will afford the most efficient means of ameliorating land that is absolutely sterile, because the leaves decay and are decomposed immediately after they fall, in the autumn, and are thus retained, instead of being either carried away by the winds or collected by man. Their fertilising power is so great, that, notwithstanding the smallness of the leaves and the trifling space they occupy, the quality of the land, in less than six years, will be so much improved, that it can no longer be compared with what it was in its original state."

In *pages 24 and 25*, M. MEDICUS laments the small degree of progress made in the cultivation of the tree, notwithstanding its great and acknowledged merits. In France particularly, where the acacia was first cultivated on an extended scale, it had made little or no progress; in so much, that he says (*page 26*), "Experiments had been recommenced, in that very country, where the culture of the tree ought to have been universal."

In Germany, the excellent treatise of M. DE CREVE CŒUR (*See Article, No. III., page 73*), which appeared to have made little or no impression in France, had been translated by the son of M. MEDICUS, and had contributed to ex-

cite that enthusiasm which there prevailed on the subject. "And yet," he adds, "there is no country that stands more in need of the acacia than France, especially in the southern provinces. In 1766, the late M. DUHAMEL assured me, that oak became every year more scarce, that the wood deteriorated, and that vessels which were constructed during his superintendence, were by no means equal to those which had been built before. The circumstance is to be easily accounted for: in the southern provinces, and in plain open countries, as the oak forests become disfurnished, the quality of the tree deteriorates in consequence of the too free admission of heat, which is inimical to it. The larch, also, cannot prosper in districts thus exposed; for it likes a cold climate, flourishing best among the Alps, and at an elevation where other vegetation almost entirely disappears. Many other species of valuable trees also delight in a temperate degree of warmth. The acacia, on the contrary, if planted closely together in woods, prospers well in these hot situations; and it is desirable that planters should undertake zealously the culture of such forests."

The author's concluding remarks refer chiefly to the forest-laws of Germany, which, by placing the proprietors of woods under the inspection of appointed official superintendence, have put them in a situation of restraint, inimical to extensive improvement. These remarks do not

apply to Britain: it would, therefore, be needless to add the recapitulation of his observations, upon the culture and practical use to be made of the trees in Germany. It may not be amiss, however, to add the following statement of facts. " Since 1793," he says, " I have planted a wood of acacias, which I extended in 1796. I have made every enquiry concerning the best method of managing copses of acacias; and I have annually, in 1800, 1801, 1802, and 1803, made small cuttings of the wood, and calculated the produce, which has surpassed my expectations.

" The public may here (at Manheim) witness the state of the facts that I have detailed in my periodical work. They will see, though not without astonishment, the rapidity with which the coppice advances in growth: they may learn, that the acacia is peculiarly adapted for fire-wood, props, supports for vineyards, and timber for water-work of every kind; and also, that when made use of for any of these purposes, it in a short time yields a considerable profit. Many persons are dissatisfied with the acacia, from an idea that the prospect of realizing a profitable return from it is too far distant; but could they be convinced that, after a period of six years at the utmost, they might depend on an annual produce, they would feel encouraged to undertake its cultivation, which would in consequence rapidly gain ground."

N O T I C E

OF

THE ROBINIA PSEUDO ACACIA

IN THE

FRENCH ENCYCLOPÆDIA.

THIS celebrated work contains a very long article under the head *Acacia*, which has been obtained by the kind attention of Dr. BOWRING. Unfortunately, a very small part of it refers to our *Robinia*, the description of which would undoubtedly be found under the latter title. It has therefore been thought advisable to select certain leading passages only, in order to show, that the learned conductors of that work were perfectly aware of the confusion created by the misapplication of the term *acacia*, to a tree which bore scarcely any resemblance to the hardy native of the new world. The article in the *Encyclopædia* was written by the celebrated ADANSON, a man famed for his voyages and literary labours.

MICHAEL ADANSON was of Scottish extrac-

tion, but was born at Aix in Provence, *anno* 1727. He was educated in the University of Paris; and in 1748 went out on a voyage to Senegal, where he made a vast collection of botanical specimens; and, in 1757, the result of his labours appeared in his *Histoire Naturelle de Senegal*, 4to. He became a member of the Academy of Sciences, and in 1763 published his *Famille des Plantes*. He lived to be reduced by the revolution to absolute poverty; so that when, on the formation of the Institute, he was invited to become a member, he answered that he could not accept the invitation, as he *had no shoes*. The Minister of the Interior then procured him a pension, on which he subsisted until his death in 1806. See *Gorton's Biographical Dictionary*, 8vo.

A scientific notice from the pen of such a writer must not be entirely passed over, though it contain repetitions of certain facts, which have occurred in our extracts from other French authorities. The few passages selected are by no means literally translated, though they exhibit the precise sense of the original French.

“ *Acacia* is the ancient name which the Greeks, during the time of THEOPHRASTUS, DIOSCORIDES, PLINY, &c. gave, and which they still at the present day give, to the tree that produces the *gum Arabic*; yet we, in these learned countries, notwithstanding the judicious observations

of several botanists, continue actually to confound under this name two other trees, which possess no properties in common with those of the gum-tree of Arabia, unless in being thorny, and in occasionally producing a little gum of very inferior quality. In other respects they differ from the acacia not only as to *species*, but in being of *genera* widely remote from it.

“ The first of these trees is a native of North America, particularly of Canada, whence it was brought to France, before the year 1600, by VESPASIAN ROBIN, Professor of Botany in the Royal Garden of Paris, where it was exhibited under the title of *acacia Americana*. ”

The learned author, it may be remarked, is not quite correct in ascribing the introduction of the robinia to V. ROBIN. This the reader will discover by reference to the letter of M. DE NEUFCHATEAU, *page* 4. The mistake is, however, of no material consequence.

He, in the following paragraphs, proceeds to describe the tree, its foliage, branches, flowers, fruits, qualities, &c., and then adds—“ Its inner bark possesses the flavour of stick-liquorice, a property which, as PLUKENET observes, has given it the name of the Liquorice-Tree among the English of Virginia. M. DE TOURNEFORT was of opinion, that, although the tree was related to the liquorice-plant, yet that

it ought to be considered of a distinct *genus*; and he therefore gave it the Latin name of *Pseudo Acacia*.

“It is astonishing,” continues M. ADANSON, “that M. DE TOURNEFORT should have devised so improper a title, to distinguish a tree which is so slightly related to the *true acacia*; as he either knew, or ought to have known, that, twenty years before his time, and even before the year 1680, ELSHOLTZ, Professor of Botany to the Elector of Brandenburg, (known by his work entitled *Flora Marchica*), had assigned to this new tree the name *Robinia*, from that of M. ROBIN, who first introduced it to Europe. It is under that title, that the natural history of a tree which possesses so many useful properties may be found, as we have detailed it in our *Famille des Plantes*, at page 323.” The other tree, to which the title of *acacia* has with great impropriety been applied, is stated by M. ADANSON, to be the wild plum, or sloe-tree, “whose fruit,” he says, “when gathered before it is ripe, and the juice expressed and then inspissated by the heat of the sun, or by fire, yields a sort of jelly or rob, which is employed medicinally.” The wild plum might perhaps, at one time, have been styled *acacia* in France; but it does not appear that, in England, the term has at any time been so grossly outraged and misapplied.

Remarks upon the true Acacia.

“ Though the genus of *acacia*, properly so called, comprises several species which cannot be separated without doing violence to the bond of union by which nature appears to have linked them together; though America produces certain species, and others grow in India; yet the three species, which produce gum Arabic* and gum Senegal in the greatest abundance, have only been found in the hottest parts of Africa, at Senegal, near the shores of the Atlantic, or in Arabia, upon the coast of the Red Sea, which countries are within the torrid zone in the southern hemisphere. The ancients, since the time of THEOPHRASTUS, were acquainted with three species of *acacia*, to which PLINY adds a fourth; though he acknowledges that it had little merit, and therefore was not much thought of. As far as we can collect from DIOSCORIDES, the red gum-tree, which more particularly bears the name of *The acacia*, was generally found in Arabia; whereas the white gum-tree was as commonly met with in Senegal, if not more so, than the red gum-tree.”

* Gum Arabic is now, in the *Materia Medica* of the *London Pharmacopœia*, and has been for more than thirty years, styled *acacia* gum. The edition of 1809 contains the following description of it—“*Acaciæ gummi*, acacia gum, called gum Arabic.—*Acacia vera*, the gum.—S. P. W. iv. 1085.—M. B. t. 67.—*Mimosa Nilotica*.”

Species I.—Red Gum-Tree.

“ The Acacia of the Greeks is described by DIOSCORIDES as the tree without malice, the puncture of its spine being not followed by any serious inconvenience. It had also been called, *Acantha Egyptia*. The Arabs give it the names of *Achachia*, &c. Also *Schitti* and *Schittim*. LINNÆUS defines it thus—*Mimosa Nilotica, spinis, stipularibus patentibus, foliis bipinnatis partialibus externis, glandulâ interjectâ, spicis globosis pendunculatis*. *Systema Nat., Edit. 12, p. 678, No. 34.*

“ This acacia grows in the deserts of Senegal, in some islands near the influx of the Niger, and also in Arabia: it scarcely attains the height of twenty feet.”

Species II.—A Red Gum-Tree.

“ Senegal produces this species, which the negroes of d'Oualo style *Gonake*: it differs from the preceding, which bears the name of *Nebneb*, in as much as it does not grow so freely in the moveable sands of the sea-coast; but commonly is found on the red, semi-argillaceous, sandy land, which commences eight or ten leagues from the sea-side, and extends inland sixty leagues within the continent, where this tree composes the greater part of those forests, which

cover nearly the whole extent of the country of Senegal.

“The *Gonake* usually rises to the height of twenty-five or thirty feet. Its trunk is straight to the extent of ten feet, and about eighteen inches broad: at that height it is crowned with open branches, which expand at an angle of forty-five degrees. The wood, which while in a humid state is of a dirty white or greyish color, acquires by drying a deep, handsome, red tint. The gum of this tree is of a darker red color, and a more bitter flavor, than that of the first species: it is yielded in equal abundance, and commands as high a price in the market.”

Species III., called Siung.

“This is also a species of the true acacia, and has never been figured in any work: it grows freely in argillaceous as well as sandy ground. I have observed it in great numbers in the forests of the interior of the continent, and also round Cape de Verd. It rarely is higher than twenty-five feet, and assumes a singular form of growth, which renders it remarkable wherever it is found. From a trunk ten or twelve feet high branches arise, which extend horizontally to the length of twenty feet; so that the entire tree, when seen from a distance, has the appearance of a large umbrella (*parasol*). The branches, young as well as old, are of a brown

color, the former are collected in bundles (*faisceaux*) of six or eight upon the latter, and are covered with single leaves.

“ The *Siung* yields a gum of a whitish color, but in small quantity : it collects in the form of little tears, which are gathered with that of the other trees without any distinction.”

Species IV.—White Gum-Tree.

The three trees above noticed belong to the genus *acacia*. There are two others described by M. ADANSON, which, he says, ought to form another genus. The first of these is the white gum-tree, the gum-tree of Senegal, that whose juice forms almost the entire sustenance of the Arabs during their journeys into the deserts of Africa. This tree only will be noticed here, because the fifth species appears to produce little gum, and to be of comparatively trifling value.

“ The white gum, although one of the most common among the trees which cover the sandy coast of Senegal, from the mouth of the Niger to the heights of Cape Blanc—though it was seen by, or at least daily within reach of the sight of, those European traders who frequented this country for more than four hundred years—had never been recognised by any one of them.” Many projects to ascertain the source of that most lucrative trade in gum had been formed

and abandoned, in consequence of the difficulties which attended their execution. So that, till M. ADANSON arrived at Senegal in the year 1748, the tree which produced the fine white gum remained perfectly unknown.

He thus proceeds—" Having reached the country with the design to discover, if it were possible, the plants that yielded so much profit to the trader, and which by advice received from M. M. JUSSIEU, of the Academy of Sciences, I learned were the gum-tree, the frankincense, bdellium, myrrh, assafoetida, opopanax, sarcocol, &c., my first object was to discover the trees which produced gum and frankincense, and these were said to grow in the same forests. I therefore determined to incur the risk of visiting those forests ; and, to do so, it became necessary to ascend the Niger, to the distance of thirty leagues from its mouth, till I should reach a place that was named the Desert, where the traffic in gum was annually carried on, and thence to pass overland fifteen or twenty leagues northward, where the said forests were situated. While a vessel was preparing for this voyage, I resolved, in order to lose no time, to make excursions by water, and to coast the isle of Senegal, where I first landed. But what was my surprise, at first setting foot on shore, at the southern point of l'Isle de Bois, scarcely a league from Senegal, when I ascertained, that one of the first trees I met with was

a gum-tree. Its trunk and branches produced gum in round masses the whole of their length. This gum was of a faded white colour, but quite transparent. I tasted it; and the sweetness void of insipidity, and the white colour of the tears, convinced me that it differed in no respect from the gum Arabic of commerce. I next examined the leaves and fruit of this tree; and it appeared to form, if not a separate genus, at least a new species of acacia: therefore, as it had not been previously mentioned by any other botanist, I sent it during the same year, with many other plants, to M. M. JUSSIEU, to communicate the discovery to the Academy, with the following descriptive character—*Acacia—acrek Senegalensibus dicta, aculeata, aculeis ternis, intermedio reflexo; floribus polyandris, spicatis, legumine compresso, lævi, elliptico*,—which M. LINNÆUS caused to be printed in 1753, in his *Species Plantarum*, p. 521, and thought fit to alter in the following manner—*Mimosa, Senegal, spinis ternis, intermedio reflexo, foliis bipinnatis, floribus spicatis*.”

“Such is the abridged account of the first discovery of the white gum-tree, which led shortly after to that of several red gum-trees, natives of the same districts; and I was enabled to dispense with a voyage thus proved to be useless, and which might have been attended with very considerable danger.”

It is needless to follow this very able but somewhat prolix writer further. Enough has been adduced to prove, that the acacia of the hot climates is very distinct from the robinia of America. They are, however, botanically related; and though not found together in the same tribe, are still ranked by modern physiological botanists in the great natural order, *leguminosæ*. There are general leading points in which all the subjects of this extensive order agree, but then again there are others which distinguish them one from the other; and therefore, as respects genera, acacia and robinia should by no means be confounded together, and the former title, as applied to our hardy tree, is improper and ought to be abandoned.

E X T R A C T S

FROM THE

WRITINGS OF MICHAUX,

*The celebrated French Naturalist, translated by
Mr. Arthur Burcham.*

OF the numerous species of trees which compose the forests of North America, eastward of the Mississippi, the *Robinia pseudo Acacia*, commonly known by the name of the *Acacia* or *Robinia*, is one of those which were first introduced into Europe. It is to J. ROBIN that we are indebted for the introduction of this tree, which is rendered still more interesting by the excellent qualities of its wood, than by the beauty of its foliage and flowers. He received it from Canada, and cultivated it on a large scale, in the reign of Henry IV., about the year 1601. Since that period, it has increased to such an extent in France, Germany, and England, that there are few persons who do not know it. LINNÆUS, in order to preserve a memorial of the acquisition of this useful tree, and to render at the same time a tribute of gratitude to him who first

propagated it in the old world, conferred the name of *Robinia* on the genus to which it belonged.

We do not find the robinia growing naturally in that part of the United States next to the Atlantic ocean, except in Pennsylvania, between Lancaster and Harrisburg, latitude $40^{\circ} 20'$; whilst, to the west of the mountains, we see it two or three degrees further towards the north. This tends to confirm an observation already made, that the soil is of a more fertile quality, and the temperature more mild, in proportion as we advance in that direction, namely from east to west. But it is towards the south-west that the robinia is most numerous. Thus it abounds in all the valleys formed by the different chains of the Alleghany mountains, and especially in that called Limehouse Valley. It is still more common beyond the mountains, in all the western states, as well as in all that division of the territory of the United States, comprised on one part between the Ohio and the river Illinois, and on the other between the lakes and the Mississippi.

According to the limits which I have just pointed out, and which may be considered as generally correct, it necessarily follows, that this tree does not grow naturally in all those states, situate to the east of the river Delaware—namely, those of New Jersey, New York,

Connecticut, Massachussets, New Hampshire, and Vermont. Neither does it grow in all the maritime division of the middle and southern states, from the borders of the sea as far as fifty or a hundred miles into the interior, all those which are seen there having been planted at different periods.

The dimensions which the robinia attains vary according to the nature of the soil, and the temperature of the climate. Thus in Pennsylvania, between Harrisburg and Carlisle, as well as along the river Susquehannah, where it begins to show itself in going from north to south, it is of much inferior height, and less in bulk, than further down in Virginia, and also in Kentucky and West Tennessee, which are situated three and four degrees more south, where the soil is of much greater fertility. This tree there acquires a diameter from three to four feet, and a height sometimes of seventy or eighty; whilst, on this side of the mountains, its dimensions are less by half.

The foliage of the robinia is light and pleasing to the sight. The individual leaves are each composed of two rows of leaflets opposite each other, and terminated by an odd one. The leaflets, to the number of nine, eleven, thirteen, and sometimes more, are of an oval form, thin, and of a very delicate texture. Their surface is extremely smooth, which renders them but little

liable to retain the dust, and they have also the advantage of being rarely attacked by insects.

The flowers, disposed in numerous pendant clusters, are beautifully white, and diffuse the sweetest odour. These fine clusters, scattered over a foliage graceful in form, and of a delicate and lively green colour, produce a very imposing effect; and with good reason render the robinia one of the most desirable trees in Europe, for the embellishment of pleasure-gardens.

The robinia was in its full bloom at Harrisburg, latitude $40^{\circ} 20'$, from the 1st to the 4th of June, 1808, at which time I passed that way. It was also in full flower at the same period in 1812, at Paris, lat. $48^{\circ} 50'$. The flowers are succeeded by narrow flat pods, about three inches in length, each containing five or six little seeds, which are commonly of a brown colour, but sometimes quite black.

When the robinia is very old, its trunk and large branches are covered with a very thick and deeply furrowed bark. Then it has lost those strong and formidable thorns, with which it is armed while less than two or three inches in diameter. Its wood, usually of a greenish yellow colour, veined with brown, is hard, compact, and susceptible of a good polish: it has also much strength, though but little elasticity. But that which above all renders it infinitely va-

luable to the United States, where the greater part of the houses and the enclosures of corn-fields are still constructed of wood, is that, of all the woods of this country, the robinia resists the ravages of decay for the greatest length of time.

Although the robinia has been considerably multiplied in upper Virginia, to the east of the mountains, as well as in the upper part of the two Carolinas and Georgia; nevertheless, the proportion in which it exists in the forests is infinitely less than that of the different species of oak, and of walnut, which form the grand mass. No where does it cover exclusively even small tracts of land of one, two, or three acres (*arpents*). It is on this account, that this and the black walnut-tree are the only kinds allowed to remain standing in the newly cleared lands, because the inhabitants can never have enough of the wood of those trees, for the uses to which they are known to be appropriate; and when required, they, by this means, find either the one or the other in the midst of their cultivated fields.

The most general purpose to which the acacia-wood is applied, and that wherein the greatest quantity is consumed, is the construction of posts, which are reckoned to be of the most durable quality. They make use of them, by preference, for the inclosures of court-yards, gar-

dens, and even farms, in those districts where this tree abounds in the forests. and in others which are not far distant from such forests. They thence transport them to Lancaster, Baltimore, and the city of Washington, to Alexandria, and the environs, where they employ them for the same purposes. When the trees have been felled in winter, at which time the movement of the sap is suspended, and when the posts or beams procured from them are not used till after they are very dry, it is calculated that they last about forty years. Experience, however, has also taught us, that their durability varies according to the state of the trees from which they are extracted. Thus in the environs of Lancaster, and at Harrisburg, a little town situated on the river Susquehannah, where a considerable trade is carried on in timber that is brought down that river, they prefer, in the first place, posts which are cut out of trees, the heart of which is red ; then those in which it is greenish yellow ; and, lastly, those in which it is white. It is this difference in the colour of the wood (which very probably is produced by the soil in which the trees have vegetated), that has given to the tree the names of *red*, *green*, and *white Locust*. In the western states, it has also sometimes the designation of *black Locust*, and it is sometimes also called the *Acacia Iron*.

At Harrisburg, a great number of acacia poles and posts are sold, the length of which is

from seven to eight feet, and the price nine pence (English) a piece, in the rough state, and twelve pence halfpenny each when they are squared and mortised. All these posts come from trees, which are less than one foot in diameter, out of which thickness two are furnished. I have remarked, that the stumps of trees, which were more than fifteen inches in diameter, were subject to decay at the heart; but, I presume, this defect does not take place in the trees which grow farther south. At Baltimore, among the timber-merchants, we meet with posts of robinia and red cedar (*Juniperus Virginiana*), the dimensions of which are similar, but their respective prices very different. The first sell at two shillings and a penny, and the others one shilling and five pence each, at which I was very much surprised: I presume, however, that this superiority of price in favour of the robinia, is due to its high degree of strength and resistance. In the western states, where this tree attains greater dimensions, and where it is more abundant than in those which are east of the mountains, the best timber for posts, and that most in request, is produced.

In naval constructions they use as much acacia as they can procure. Its wood is equally as durable as that of green oak and red cedar; and it has the advantage of being lighter than the first, and stronger than the second. It is made use of in the upper and lower timber-work of

ships, conjointly with the green oak, white oak, and red cedar, but only in a very small proportion; for, in the interior of Virginia, Maryland, and Pennsylvania, from whence it is obtained, and where, as I have before said, it grows naturally, nine tenths of the robinias do not exceed one foot in diameter, and from thirty-six to forty feet in height. On this account, curved or knee timber of convenient length cannot, without great difficulty, be procured. These small trees, on the contrary, are not attended with any waste when they are sawn into posts.

Another valuable property of the wood of the robinia, and one very important in ship-building, is this: it is the best wood that can be used for making trunnels or pins (*gournables et chevilles*), designed to fasten the side-planks down to the frame-work; and there, so far from decaying by exposure, it acquires in the long run extreme hardness of texture.

They make use of no other kind of trunnels and pins throughout all the sea-ports of the middle states. The mean rate at which they are sold at Philadelphia, where they are imported by the river Susquehannah, is about 50 francs (£2 .. 1 .. 8) the thousand. From fifty to one hundred thousand of them are annually exported into England from this place.

The acacia is but very rarely employed in the

construction of houses, even of those which are built of wood, in the districts where this tree grows naturally in the forests ; and when they do make use of it, it is expressly as supports to the sleepers, on which the frame-work rests. These sleepers are commonly made of oak ; and are more liable to decay than those of acacia, when placed immediately upon the earth. The valuable property of resisting decay, possessed by this wood in an eminent degree, and to which that of no other tree can at all approach unless it be the red mulberry, points out sufficiently the different uses to which it may be applied, in those districts where it is easily procured ; but its consumption in the United States is in fact restricted to those purposes which I have just noticed ; and they are in error who have asserted, that it is used for making casks and hoops, and in the formation of hedges.

The wood of the robinia when well dried is very hard ; and its grain, being close and pretty fine, renders it susceptible of a good polish. It is on this account, that, at Paris, within these ten years, it has been in a great measure substituted for box-wood, in light articles of turnery, such as boxes of different forms, salt-cellars, sugar-basins, candlesticks, &c. They also make salad-forks and spoons of it, and many little articles which are carefully wrought into pleasing forms and sold at a cheap rate.

The rapidity with which the robinia grows was soon remarked by the inhabitants of the United States ; for this advantage cannot be too highly appreciated in a tree, whose wood unites so many good qualities. It is this consideration which has induced many inhabitants to plant it ; and this happy idea has been particularly carried into effect in the lower part of the states, situate at the north-east of the river Delaware, and which comprise those, as I have before said, that do not produce the tree naturally. Thus between New York and Boston, the distance between which is about 300 miles, we meet here and there with farms, the proprietors of which have planted robinias near their houses, and sometimes even in the open ground on the outside of the boundary-fences which enclose their fields : but the number of those, who have formed these belts or plantations, does not amount to more than a twentieth part of the landholders at the utmost. On Long Island, where the city of New York is situated, the woods having been in a great measure destroyed during the war of independence, many persons have successfully made the attempt to cultivate this tree upon a more extensive scale : but these plantations are not numerous ; and with the exception of the largest trees, which are sold for trunnels for the ships built at New York (for which purpose, however, the supply is not equal to the demand), the robinias planted are consumed by the proprietors of the soil, on which they are found.

Besides, in no part of the United States have they yet formed regular plantations of this tree, to the extent of 10, 20, or 30 acres (*arpents*), although many agricultural societies have offered premiums to encourage them.

Unfortunately within the last fifteen or twenty years, an unforeseen circumstance has occurred, which will prove a serious obstacle to the exertions that may be made hereafter to propagate the robinia in all those divisions of the United States which were first inhabited. This obstacle may be ascribed to a certain winged insect, which, during that period, has been found to attack the trunk of the growing robinias, at three, four, and five feet above the surface of the ground. It pierces through the bark, introduces itself into the centre of the tree, and gnaws it in all directions for the space of a foot in such a manner, that, after the second or third year, the trees thus affected yield at once to the efforts of the wind, and snap off.

This inconvenience is already so great, that many persons decline to plant robinias. In Virginia, those which grow naturally in the forests have not yet, to my knowledge, been attacked by this destructive insect; but those, which have been planted near inhabited places, have already suffered much by it. It is certainly an evil of startling magnitude, for which as it appears to me it will be very difficult to find a re-

medy ; and the effects of it will be still more sensibly felt, when the destruction of the existing forests shall be effected. This event, the natural consequence of increased population, and of the absence of efficient preservative measures, will compel the Americans to adopt the European practice of planting considerable tracts of land with forest-trees, of which the robinia will form a certain proportion. The necessary result of this measure must be, that the robinias will successively disappear from the American forests by the consumption of the wood, which takes place daily ; and as this cannot be reproduced in the first peopled districts, in consequence of the ravages of the insect, it must become extremely rare, even in the very countries of which the trees are natives, whilst in Europe, where they do not meet with this accident, they will be propagated with the greatest possible facility.

Though I have said that I have seen in North America some robinias, which were from 70 to 80 feet in height ; nevertheless, this luxuriance of vegetation does not take place, but in the most fertile portions of the states of Kentucky and West Tennessee, which, when they are first broken up, produce successively and during a long series of years, without being manured, from 90 to 180 bushels (30 or 60 *minots*) of maize per acre. Commonly, however, this tree does not rise to above 40 or 45 feet, in lands

of inferior quality, such as those which produce only oaks and hickory ; so that, in comparison with those trees, the robinia appears merely as a tree of second-rate size, from which pieces of timber of equal dimensions can very rarely be procured. It is on this account, that, throughout Europe, wherever the oak, beech, chestnut, and elm appear to flourish, in no case ought the robinia to be substituted for them.

Although it may be true, that, in that part of Europe situate beyond the 48th degree of north latitude, persons apply themselves most sedulously to the formation of robinia plantations, and many facts and observations have been published on its culture ; I think, notwithstanding all the success which they are said to have obtained, that this tree does not there find itself in its appropriate climate : for I, as well as many other persons, have had opportunities of observing, that its vegetation is accelerated in proportion as we advance towards the south. This may be remarked even in leaving Orleans, latitude $47^{\circ} 54'$; for though there is only about one degree of difference between the latitude of Orleans and Paris, the robinias, which we see at and around the former city, appear much stronger than others that are further north. This is evidently owing to a greater degree of heat. I cannot, therefore, but consider the southern departments of the empire, and the kingdom of Italy, as the only countries of Eu-

rope, wherein all the advantages, which ought to be derived from the rapid growth of the robinia, might in all probability be secured. If private individuals, who naturally are more anxious than the government to realize a profitable return, were to plant the tree in pretty good soil, they might be able, after twenty or twenty-five years, to obtain from the robinia twice the quantity of timber which could be produced from any other kind of tree ; and if the quantity were considerable, it might be cut out, as it is in America, for trunnels and pins for ship-building, and these would fetch a good price in all the seaport towns. Being taken from trees which have grown in uncultivated and open countries, the timber would be more valuable, and of greater utility, than that which, in America, is procured from trees of the primitive forests ; for in that part of the new world, the atmosphere, being more humid, has an unfavourable influence on the quality of the wood.

According to the authors who have, at different periods, written on the robinia, we find that, about a hundred years ago, it was in very great request in Europe on account of the beauty of its foliage, and the perfume of its flowers, which is very grateful. Subsequently, however, defects were discovered ; and for half a century it remained neglected, and was almost forgotten. Recently, however, or within the last ten or fifteen years, some agriculturists have again

brought it into notice, by recommending it, less as an ornamental tree (although no one can call in question its merit in that respect), than as a useful one, on account of the good qualities of its wood.

Many observations in favour of the robinia have been published in France, as well as Germany ; and little has been said that is hostile to it. Nevertheless, among those persons who turn their attention to the planting of woods, we meet with a great number who are opposed to its propagation.

It appears to me, then, that, on one side, the tree has been much extolled, while on the other it has been too much undervalued ; and that few have been aware of the superiority, which, in many respects, it possesses over most of the trees that grow in the temperate zone.

If I were permitted to state my opinion on the subject, I should say, that the most valuable properties of the robinia consist, first, in the rapidity of its vegetation compared with that of our own hard wooded indigenous trees : secondly in the use to which its wood may be applied, on account of the excellent qualities it possesses, and which cause it to be employed in America for a number of important purposes. To the advantages of a very rapid growth, with great strength and durability of wood, it unites

another most remarkable quality—one which trees of quick growth do not in general possess, and which the authors who have written most in favour of the robinia have not made sufficiently prominent : *it is that of converting the sap-wood, or alburnum, into heart-wood* after the third year, which change does not take place in the oak, chestnut, elm, or beech, till after ten or fifteen years. Whence it follows, that if robinias were planted at the same time with the above-mentioned trees, and in good land, and felled at their twenty-fifth or thirtieth year, they would have acquired generally a third more, and in many instances double, the bulk of the others ; and it would be found, that the trunks, free from sap-wood almost throughout the whole breadth, would be large enough, to be employed for the many and various purposes to which the good qualities of the wood render it applicable, while, as respects the other kinds of trees, in addition to their not being strong enough at that age to be turned to any useful purpose, the whole breadth of real timber, or heart-wood, would scarcely amount to one half of the diameter of the trees. This is certainly a most important consideration ; for it is well known, that for all works which require the timbers to be solid, and of real durability, it is essential to strip off every particle of the sap-wood, this wood being liable to become worm-eaten when used for in-door work, and decaying very quickly when it is externally employed, and exposed to the weather.

But if the robinia present these marked advantages, it has also defects which counterbalance them, and which it would be difficult to remedy. Thus, when it stands in an isolated situation, its branches give way easily to the efforts of the wind, and either break or become shattered. Left entirely to itself, after having acquired a certain elevation, its trunk rarely preserves its straightness; and the principal branches, being badly placed and of unequal thickness, become very straggling. This gives to its top an irregular and rather disagreeable aspect. Its moveable and transparent foliage renders it by no means an umbrageous tree. By these inconveniences, therefore, it is rendered very unfit for vistas and avenues in gardens of great extent, or to be planted in rows along the high roads. For these purposes, the small leaved elm is infinitely superior, and ought always to be preferred; as it not only is more readily brought into shape by pruning, but the character of its foliage is more tufted and massive, and therefore affords a more impervious shade, and its wood is of greater general utility to the wheelwright.

It has also been a subject of remark, that amongst robinias, whose rich verdure announces a vigorous state of vegetation, some are found to languish and turn yellow in the foliage. This is another inconvenience attached

to this tree, and it is difficult to assign a cause for it.

It appears that, for many years, in the department of La Gironde and its environs, a method has been adopted for turning the rapid growth of the robinia, cultivated in coppices, to advantage. They cut it, we are informed, at the fourth year of its growth, and obtain stems strong enough to be split in two : of these they make vine-props, which last more than twenty years. The old robinias are also topped every three years, for the same purpose. This vigorous vegetation is certainly produced by a greater degree of heat.

Some persons, not altogether without reason, object to the robinia, when cultivated as coppice-wood, because, at the period when it ought to be cut, it remains covered with strong and formidable thorns, which render the cutting and clearing off not only difficult, but more expensive than the coppice of any other sort of wood, a disadvantage which appears however to be compensated by the produce, which is twice as considerable, and it is obtained in less than half the time.

This is a proper place for me to point out a new variety of the acacia, *Robinia pseudo Acacia spectabilis*, which is entirely void of thorns

in its youth. This valuable variety is distinguished by its leaves, which are larger, as well as by its still more rapid vegetation. If the seeds, which this variety has already yielded, have reproduced some thorny plants, it is not improbable that the seed which shall be gathered from this progeny successively, will finally produce the thornless species. In the mean time, if any one procure a few trees that are productive of suckers, the species may be multiplied thereby either as offsets or as layers, or rather by cutting little trenches round about the tree. The roots thus wounded will send up a considerable number of shoots or suckers. It is evident that this variety of the robinia is to be preferred for coppice-wood, because, not being armed with those formidable thorns with which the common robinia is garnished in its youth, the cutting and clearing off these coppices will be performed at less expense, and without any danger to those who undertake it. The young branches, covered with leaves, may also be given without any risk to cattle, which in Europe, as well as in America, are very fond of them. It is to M. DESCOMET, a cultivator distinguished alike by his theoretical and practical knowledge of agriculture, that we are indebted for this estimable variety of the acacia, which doubles the value of the tree, to those who cultivate it after this manner, especially in the south of France.

Some writers have remarked, that the most profitable way to reap advantage from bad lands (such as those whereon the oaks and other hard-wooded trees die at the top, and which, by their exhaustion, are unable to produce those species of trees any longer) would be, to form robinia coppices thereon. In the environs of Paris, and more to the north, these attempts have not always been successful. It is true that, during the first three or four years, the robinia outstrips by far the birch planted at the same period, and affords the most promising anticipations; but at the seventeenth or eighteenth year, the voracious roots of the robinia appear to exhaust all the substance of the soil, that is peculiarly suitable to its nature; the branches throughout half the height of young trees perish; and their short and dwindling annual shoots announce, that they are in a state of decay: while the vegetation of the birches is, on the contrary, beautiful and vigorous, in so much that several of them have already attained the height of the acacias. Possibly these also ought to be pruned at the third or fourth year.

Such are the results of the facts collected in America respecting the robinia, and of the observations which its culture in Europe has suggested. Advantages as well as inconveniences are attached to its propagation. Never-

theless I am of opinion that the former outbalance the latter; and that, as an ornamental and useful tree, it merits, especially the variety without thorns (*inermis*), a place in our pleasure-gardens and plantations, more particularly in the southern parts of the empire.

NOTICES
OF
THE ROBINIA PSEUDO ACACIA
IN THE
WORKS OF BRITISH WRITERS.

It is to be regretted, and indeed is somewhat remarkable, that we possess few authorities of moment on the culture of this tree in Britain. The planting of it for profitable purposes does not appear to have been contemplated ; and, in fact, it was regarded simply as an ornamental plant, until between forty and fifty years ago, when DR. HUNTER described its valuable property in ship-building, in the following Note to his Edition of EVELYN's *Sylva*.

“ My excellent friend, JOSEPH HARRISON, Esq., of Bawtry, has favoured me with the following observations, in a letter dated July 25th, 1782. ‘ The first experiment that I know of, respecting the application of the timber of the Locust-tree to any purposes in ship-building, was in Virginia, where I resided, sometime a-

bout the year 1733 ; and there, happening to be acquainted with an ingenious shipwright, that had been sent over by some merchants of Liverpool to build two large ships, I had frequent conversations with him respecting the qualities of the several principal timber-trees in that country. Being a person of observation, he had made many useful remarks on that subject, which the nature of his employment afforded many opportunities of doing with advantage. He reckoned the oaks, elms, ashes, and many other timber-trees common to both countries, much inferior to the same sorts in England : but frequently spoke of the locust-tree as of extraordinary qualities, both for strength and duration ; and used often to say, if a sufficient quantity could be had, it would be the best timber he had ever met with for the building of ships. After he had completed his engagements with his employers at Liverpool, he set a small vessel on the stocks for himself ; but unluckily, not having a sufficient quantity of iron for that purpose, and none being to be had at that time in the country, he was obliged to put a stop to the work, till he bethought himself of the following succedaneum. He had formerly, as hinted above, observed the extraordinary strength and firmness of the locust-tree ; and, on this occasion, took it into his head, that tree-nails of that timber might be substituted for iron bolts, in many places where least liable to wrench or twist, as in fastening the floor-timbers to the

keel, and the knees to the end of the beams, which two articles take up a large proportion of the iron used in a ship, purposing, when he arrived in England, to bore out the locust tree-nails, and drive iron bolts in their stead.

“ ‘ When he first informed me of this scheme, I must own I thought the experiment very hazardous. However, as necessity has no law, he put it in practice. The ship was built in that manner, loaded, and sailed for Liverpool, where she arrived safe ; and though they met with some blowing weather on the passage, she never made so much water, but that one pump could easily keep her free. She returned back to Virginia the next year, when I had an opportunity of being informed by the builder himself, who was then captain of her, of what had been the result of his project. He said, during the passage, especially in blowing weather, he was very attentive in examining the water-ways, as at that place weak ships are most liable to work and strain ; but that he could not perceive any thing more than is usual in other vessels. When unloaded, she was hauled ashore upon the bank, in order to be searched both outside and inside, when, on the strictest examination, it was found the locust tree-nails, that had been substituted instead of iron bolts, seemed, to all appearance, to have effectually answered the purpose intended : however, it was thought prudent to take several of them out, and put in iron bolts

in their room ; and this operation afforded another proof of their extraordinary strength and firmness, as they endured to be backed out with a set bolt, just as well as though they had been iron, whereas oak tree-nails, are usually bored out with an augur.

“ ‘ The next voyage the ship made was to the West Indies, where the captain died, and with him ended, for the present, any further prosecution of this matter ; for though the success of the above experiment was known to many, yet, as is frequently the case with new discoveries, none that I ever heard of made any use of locust tree-nails in ship-building till many years after, though on the goodness of that article greatly depends the strength and durableness of a ship. I frequently recommended it when opportunities offered, but all to no purpose, till about twenty years ago, when I was settled in trade at Rhode Island, I persuaded some ship-builders to try the experiment : but, notwithstanding all my endeavours, the use of locust tree-nails still continued to be little practised or known, till it happened to be adopted by a builder of some eminence at New York, and of late years has been introduced into general use there, and in some parts of New England : but, as yet, the use of the locust-tree in ship-building is confined to the article of tree-nails on account of its scarcity ; for, was it near as plentiful as oak, it would be applied to

more purposes, such as knees, floor-timbers, foot-hooks, &c., being much superior to it both as to strength and duration, and, from its spreading into branches, it affords full as large a proportion of crooks, or compass-timber, as the oak.' "

DR. HUNTER also stated, in proof of the durability of this wood, that this property had been well ascertained by some pieces of locust still continuing firm and sound, in some old houses in New England, that were built when the country was first settled.

The celebrated PHILIP MILLER, who first published his Gardener's Dictionary in 1731, mentions the robinia. He has the following observations : " The seeds were received in England from Virginia, after the period when M. ROBIN brought them to Paris. Trees were raised here in several gardens, which, for some years, while young, were in great esteem ; but, as they grew larger, their branches were frequently broken by strong winds in the summer, which rendered them unsightly, so that for several years they were seldom planted in gardens : but of late years it is become fashionable again, and great numbers of the trees have been raised ; so, at present, there are few gardens in which there are not some of the trees planted.

“ This sort grows to a very large size in America, where the wood is much valued for its duration : most of the houses which were built at Boston, in New England, upon the first settling of the English, were of this timber, which continues very sound at this time.

“ It grows very fast while young, so that in two or three years, from seed, the plants will be eight or ten feet high ; and it is not uncommon, to see the shoots of this tree six or eight feet long in one summer. The branches are armed with strong, crooked thorns, garnished with winged leaves, composed of eight or ten pair of oval lobes, terminated by an odd one : they are of a bright green, entire, and sit close to the midrib.

“ The flowers come out from the side of the branches, in pretty long bunches, hanging downward, like those of the laburnum, each flower standing on a slender footstalk. They are of the butterfly or pea-blossom kind, white, and smell very sweet. They appear in June, and when the trees are well charged with flowers, they make a fine appearance, and the odour perfumes the circumambient air ; but they are of short duration, seldom continuing more than one week in beauty. After the flowers fade, the germens become long, compressed pods, which, in warm seasons, come to perfection in England, but ripen late.

“ The leaves of this tree do not come out till late in the spring, and they fall off pretty early in the autumn, which renders it less valuable than it otherwise would be, were the leaves of longer duration.”

The foregoing extract is taken from the abridged edition, 4to, of the Gardener's Dictionary, dedicated to the DUKE of NORTHUMBERLAND, December 15, 1770. It contains and substantiates the leading facts adduced by the foreign authorities : hence is of great moment and value to the English reader ; and PHILIP MILLER, that “ *great prince of gardeners*,” as he was *par excellence* styled by LINNÆUS, is an evidence of no little importance. His judgment was sound, his experience most extensive, and his practical knowledge notorious.

The late REV. WILLIAM GILPIN, in his elegant work—Remarks on Forest Scenery—notices the acacia. His remarks confirm to a certain extent those of the French authors, some of which he had evidently perused. He says—“ Among elegant, pendant trees, the acacia should not be forgotten ; though the acacia which we have in England (called by the botanist, *the robinia*), is perhaps only a poor substitute of this plant in its greatest perfection. And yet even ours, when we have it full grown, is often a very beautiful tree, whether it feathers to the ground, as it sometimes does, or whether it is

adorned with a light foliage hanging from the stem. But its beauty is very frail. It is of all trees the least able to endure the blast. In some sheltered spot, it may ornament a garden; but is by no means qualified to adorn an exposed country. Its wood is of so brittle a texture, especially when it is encumbered with a weight of foliage, that you can never depend upon its aid in filling up the part you wish. The branch you admire to-day may be demolished to-morrow. The misfortune is, the acacia is not one of those grand objects, like the oak, whose dignity is often encreased by ruin. It depends on its *beauty* rather than its *grandeur*, which is a quality much more liable to injury. I may add however in its favour, that if it be easily injured, it repairs the injury more quickly than any other tree. Few trees make so rapid a growth."

The reverend author quotes the story related in pages 84 and 85. *Gilpin's Forest Scenery*, vol. 1, p. 71-3, 8vo edit., 1808.

In LOUDON'S *Encyclopædia of Gardening*, edit. 1826, p. 990, we read—" *The Acacia or Locust-Tree—Robinia pseud-Acacia*. This is a thorny, fast-growing tree, of middling stature, a native of America, of no great beauty as a tree, but ornamental when young, and well adapted for copse-wood and rough timber. It flowers in June and July, and ripens its seeds in Septem-

ber. The leaves come out late in the spring, and fall off early in the autumn, like those of the ash.

“ *Use.* The timber is much valued in North America, and said to be superior to that of the laburnum, being close-grained, hard, and finely veined; and, in America, more valued by the cabinet-maker, than any other native timber whatever. PURSH, in his valuable *Flora*, asserts that, being nearly incorruptible, it is equally useful for posts and gates. We are informed by a friend, that gate-posts of this timber, on a property near Baltimore, have remained fresh for nearly a century. The finely pinnated leaves, and pendulous, white, odorous flowers, add greatly to its beauty. Its value is scarcely known in this country. *From Caled. Mem.* ii. 414.

“ *Soil and site.* It prefers a deep sandy soil, and rather sheltered situation, being very apt to throw up suckers from the running roots; and as it stoles freely, it seems peculiarly calculated for coppice woods. BEATSON (Com. to the Board of Agr.) has cultivated it in this way to great advantage.”

But the most important body of evidence on the culture of the Acacia in England, and the uses to which the tree may be devoted, is to be found in Mr. COBBETT's *Woodlands*, a work

which cannot be read without a feeling of pleasure and interest. Mr. COBBETT enters into the pith and marrow of his subject, he writes *con amore* of the “*tree of trees* ;” and what adds to the value of the directions he has given is, the certainty of his experience. His authority is *real*, because he has been a cultivator of the acacia in the great way, from the seed-bed, and for a succession of years. His treatise on *The Locust* occupies 48 pages of the Woodlands, and is comprehensive of every species of evidence that any reader could desire. From this the following interesting particulars are selected : they refer chiefly to the valuable, the inestimable qualities of the timber.

“ *Par.* 328. The wood is very hard, and close, and heavy ; it is yellow, almost as box, but the grain not so fine. The durability of this wood is such, that no man in America will pretend to say that he ever saw a bit of it in a decayed state. This seems hyperbolical ; but every American of experience in country affairs will, if appealed to, confirm what I say. It is absolutely indestructible by the powers of earth, air, and water. Its strength far surpasses that of the very best of our spine oak. It is to this timber that the American ships owe a great part of their superiority to ours. The stanchions round the deck are made of locust ; and while much smaller than the stanchions of oak, will resist a sea three times as heavy as the oak

will. The tiller of the ship is made of locust, because it demands great strength, and is required not to be bulky. For the same reason, the martingales of ships are made of locust; and if a ship had all its ribs, and beams, and knees of locust, it would be worth two common ships. Further, as to ship-building, that important article, the TRUNNELS, when they consist of locust, make the ship last, probably, twice as long as if the trunnels consisted of oak. Our Admiralty know this very well, or at least they ought to know it. These trunnels are the *pins*, of which so many are used to hold the side-planks on the timbers of the ship. Trunnels, is said to be a corruption of tree-nails; but I do not believe it. However, we know what these things are: we know that they are an article of the very first importance in ship-building: we know that the *hardest of our spine oak* is picked out for the purpose: and, with all that, we know that the trunnel is the thing that first rots; for the water, or at least the damp, will get in round the trunnel, and between it and the plank, and if water or damp hang about oak, the oak *will rot*. All the American public ships are built with locust trunnels, and so are all the merchant-ships of the first character.

“ 330. But important as these matters are, they are, by no means, to be compared to the various uses about buildings and fences.”—“The

ends of beams and of joists, if they rest upon brick or stone, where the moisture is constantly about them, rot in a few years. The points of rafters, and the pins which hold rafters together, are always rotting. If these things were made of locust, your house would be safe for ages. Every where, when you want something to lie sopping in the wet, and at the same time to be exposed to the air, you should have locust. Endless are the uses to which it might be applied. A bottle-rack, for instance, that you want out of doors and hidden in a corner, a grindstone-stand, a horse-block ; but particularly a cart-house, or any thing that requires pillars, the bottoms of which are to go into the ground. Go into any farm-yard in England, I do not care what farm-yard it is, and you shall find in the cart-house one of these things : first, the posts that support the building rotting off very fast, just where they meet the ground ; second, those posts rotted off, and cut off, and some stones put under them, to the manifest risk of the cart-house ; third, the cart-house actually tumbling down, in consequence of the rotting off of the posts. This is notorious : every farmer, every landlord in the kingdom knows it."

" At JUDGE LAURENCE'S (October 16, 1819)
I saw a new cider-house, built against a hill,
the upper story of it supported in front by some
locust posts. These posts, the judge told me,

had stood for forty years, or rather better, as the posts of a cart-shed. They were as sound as they had been the first year they were cut down. In our stables in England, you see stones put at the bottom of the stall-posts : what a plague it is ! Little locust trees only about seven years old would, for these purposes, make posts that would last for ever. Every one knows how the sleeper (as I think they call it) rots ; that is to say, the piece of wood that goes along at the bottom of each side of the stall. We know, also, how the manger-posts rot off at the ground. Use locust timber, and it will wear out the stone walls of the building."

MR. COBBETT proceeds to state his anxious desire to procure *evidence*, that might substantiate the facts he had witnessed : he adduces testimonials, signed by witnesses of credit, in proof of the durability of the timber in certain cases particularly related by him : he then comes to the great, the paramount questions :—Will these trees grow, and attain a good size in England ?

" 349. The quickness of growth is a great consideration ; because every man will say, that, if this tree will grow in England, and will grow faster than any other tree, to introduce it must be a benefit greater than can easily be described. I am going to state the actual admeasurement of my own planting at three differ-

ent times—that is to say, in 1807, 1809, and 1813.

“ 350. The scene of the plantings is a piece of ground of about three acres, perhaps, close by the village of Botley in Hampshire.”
“ When I entered on the place in 1805, there were some Lombardy poplars, and some few other things of the tree and shrub kind. I grubbed them all up.”

“ 352. In 1806, I imported several kinds of forest-seeds from the North American states, in which I had resided from 1792 to 1800. Of locusts I sowed but little seed. It was sown in the spring of 1806, and two of the plants were planted out in April 1807.

“ 353. In 1808, I got some more seed, and in 1809 I planted five more of the plants. These also were planted in April, and very late in April.

“ 354. In 1812, I sowed some more seed, and in 1813 (in April again) I planted out five of the plants.

“ 356. *The two trees planted in 1807, raised from seed sowed in 1806. These trees have had seventeen years' growth.*

No. 1.

Height, 42 feet.

Inches round, 68 at bottom

58 at 3 feet up

40 at 6 feet

32 at 9 feet, limb 1

22 at 9 feet, limb 2

25 at 12 feet, limb 1

18 at 12 feet, limb 2.

No. 2.

Height, 38 feet.

Inches round, 60 at bottom

34 at 3 feet, limb 1

34 at 3 feet, limb 2

31 at 6 feet, limb 1

33 at 6 feet, limb 2

22 at 9 feet, limb 1

22 at 9 feet, limb 2

22 at 9 feet, limb 3

17 at 12 feet, limb 1

18 at 12 feet, limb 2

18 at 12 feet, limb 3.

“ The five trees planted in April 1809, raised from seed sowed in 1808. Fourteen years' growth.

No. 3.

Height, 38 feet.

Inches round, 28 at bottom

24 at 3 feet up

23 at 6 feet

Inches round, 23 at 9 feet
19 at 12 feet.

No. 4.

Height, 35 feet.

Inches round, 28 at bottom
22 at 3 feet up
21 at 6 feet
18 at 9 feet
17 at 12 feet.

No. 5.

Height, 39 feet.

Inches round, 26 at bottom
23 at 3 feet up
20 at 6 feet
14 at 9 feet, limb 1
13 at 9 feet, limb 2
13 at 12 feet, limb 1
12 at 12 feet, limb 2.

No. 6.

Height, 36 feet.

Inches round, 24 at bottom
22 at 3 feet up
20 at 6 feet
15 at 9 feet
13 at 12 feet.

No. 7.

Height, 35 feet.

Inches round, 22 at bottom

Inches round, 20 at 3 feet up
16 at 6 feet
14 at 9 feet
12 at 12 feet.

“ The five trees planted in April 1813, raised from seed sowed in 1812. Eleven years’ growth.

No. 8.

Height, 39 feet.

Inches round, 32 at bottom
25 at 3 feet up
24 at 6 feet
19 at 9 feet
16 at 12 feet.

No. 9.

Height, 38 feet.

Inches round, 33 at bottom
24 at 3 feet up
23 at 6 feet
19 at 9 feet
16 at 12 feet.

No. 10.

Height, 37 feet.

Inches round, 38 at bottom
30 at 3 feet up
25 at 6 feet
24 at 9 feet
18 at 12 feet, limb 1
19 at 12 feet, limb 2.

No. 11.

Height, 40 feet.

Inches round, 36 at bottom
30 at 3 feet up
26 at 6 feet
24 at 9 feet
19 at 12 feet.

No. 12.

Height, 40 feet.

Inches round, 38 at bottom
31 at 3 feet up
28 at 6 feet
26 at 9 feet
22 at 12 feet, limb 1
16 at 12 feet, limb 2.

“Now let it be observed, that these trees are growing at Botley; that any body may see them there; that there are thousands of persons who can bear testimony to the rise of the plantation; that the men who planted these trees are living, and on the spot too.”

“359. But, now, as to the *soil*. No soil can be too good for such trees. But the locust will grow on almost any soil. The reader will have perceived a great difference in the rate of the growth of the three plantations; and I am now about to show the cause of it. The *first* plantation (No. 1 and 2) was made in deep, rich, fine mould. The *third* plantation (No. 8

to-12) was made in good loam, and by the side of running water. But the *second* plantation (No. 3 to 7) was made in poor, gravelly soil, having about a foot of earth, pretty well mixed with stones at the top, and then, as you went down, more and more of gravel. In short, very poor land indeed : a gravelly brow, with, at about four feet down, a bed of sour clay under the gravel. This ground was, however, well trenched, in the manner recommended in this work : the gravel was kept at bottom, though the ground was *all well moved* to the depth of two or three feet.

“ 361. This tree grows even *better* in England than in the United States of America generally. Along the coast, in Pennsylvania, it will not thrive. It grows pretty well in some parts of Long Island, but not nearly so fast and so *clear* as in England. They plant it in their fields, though they have so much of natural woods. They never neglect to cherish the locust tree, though they slaughter every thing else. It is *very dear* compared with other timber. A good large tree will fetch from *ten* to *twenty* pounds ; and while this is the price of locust, they cut up the most beautiful oak trees for fire-wood.”

The reader will bear in mind, how much has been said by the French authorities, of the value of the acacia in the vineyard-districts.

Those remarks will be equally important to us, if we apply them to the use that might be made of the tree for the purpose of procuring durable *hop-poles*. MR. COBBETT takes up this subject : he observes,

“ 363. The ordinary height of a hop-pole, is about 15 or 16 feet. To obtain poles of sixteen feet would require, in land worth a pound an acre annual rent, *six years'* growth, and no more.”

“ 365. How much is a sixteen feet hop-pole worth, that does not require shaving, and that will last *forty years*? An ash pole, when shaved, will last three years, and a part of it four years ; but a bit must come off at the bottom of it in each of the two last years, which makes it but short ; and, by this time, it is wholly unfit to make stand against the wind, when loaded with the binds and leaves and hops. *One* locust pole is, then, worth more than *ten* ash poles, because there is *ten times* as much cost in carriage, and ten times, nay *thirty times*, as much cost in pointing ; besides the falling off in length in the ash pole, during the last two years of its service. The carriage is, perhaps, upon an average, one third part of the cost of the pole. Taking all these things into consideration, *one* locust pole must be worth nearly a *score* of ash poles of the same size and length.

“ 374. ——— An instance of the superiority of the locust over other trees, in point of quickness of growth, I had seen in a plantation of MR. GUNTER, at Earl’s Court, less than a mile from the village of Kensington.

“ 375. This plantation was made fifteen years ago. It consists of locusts, Scotch firs, sycamores, limes, Spanish chestnuts, beeches, ashes, and oaks. I have, by permission of MR. GUNTER, had the trees of this plantation measured with great exactness. The whole of the trees were planted at one time. The soil is every where the same. The trees were mixed in the plantation ; and therefore this is as fair a trial, *as complete a proof*, as can possibly exist. Each tree was measured to ascertain the inches round at the bottom, then round six feet up, then round twelve feet up, then round the biggest limb, and then the height of the tree *in feet* was taken. To save room, I shall only give the *average* dimensions of each sort of tree ; so that here we have an account, from which a comparison can be made in a moment. The reader will be surprised to see the vast superiority of the growth of the locust over even the softest and most fast growing of our English trees ; but there are the trees to be seen by any gentleman that will apply to MR. GUNTER’s bailiff, who, I believe, planted the trees. And as to the *soil*, it is likely to be *good* ; but it is the same for all the sorts. Look, then, at this table. See the

vast difference. See one limb of every locust nearly as big round as the ash, at *the ground*. See the locust, in all its different girts a great deal *more than double* the average of all the other trees ; and finally, see the locust twenty-seven feet high, while the average of all the other trees is less than eighteen feet.”

<i>Sort of Tree.</i>	Inches round at bottom.	Inches round 6 feet up.	Inches round 12 feet up.	Inches round a limb.	Feet in height of the tree.
Locust	31	25	12	7	27
Scotch Fir	16	10	5	2	17
Sycamore	15	10	5	3	22
Lime	17	8	5	2	18
Spanish Chestnut	19	14	12	2	19
Beech	10	9	5	—	19
Ash	12	10	5	1	17
Oak	11	7	4	—	12

Little more need be said ; and, in fact, the reader who is desirous to ascertain more of the uses of the tree, and the mode adopted by MR. COBBETT for its propagation and culture, are referred to his work, *The Woodlands*, 8vo, 1825.

PART II.

ORIGINAL COMMUNICATIONS

ADDRESSED TO

MR. WITHERS.

ORIGINAL COMMUNICATIONS.

No. I.

Extract of a Letter from LORD VISCOUNT NE-
VILL.

Dear sir, -

I FEAR our friend MR. ALDERSON has spoken in higher terms of my locust trees, than they at all deserve. I reside upon a family-living, and have done so about ten years. I have the advantages of a good soil, and good fellowship with my parishioners. These circumstances have, probably, induced me to continue here since my change of circumstances.

I certainly have one very handsome locust, which I shall be most happy to show you. It grows in an exceedingly good position, and is very elegant in its form. Within a very few feet of the ground, it branches uniformly out, and presents altogether a singularly handsome tree. I have, also, others of much more recent growth, fine for their years. These last are

about forty, or forty-one years old. The former I have no means of ascertaining the age of, only guessing it. In several alterations which I have made from time to time, I have been obliged to take down some of these trees, which I have converted into a great many uses—gate-posts, sills, rails, hurdles, gates; in short, in every place where it was an object to place the best and most durable stuff. It has frequently happened, in a small place like mine, and with an inclination to be doing something, that I have had occasion to pull down and alter that which I made some five or six years before; and in every instance where I have met with the locust, I have found the stuff just as sound, and as little injured by time, as on the day it was placed in its position; when, at the same time, oak, and the other better sorts of wood, have been greatly affected. I can have no doubt of its excellence, whether I consider it as timber or as underwood. MR. COBBETT, when staying occasionally in this parish with MR. CLARKE, has been here: he has paid the highest compliment to the largest of the trees, not so much from its size as its general appearance.

Signed,

NEVILL.

Bergh Apton,

July 13, 1828.

No. II.

From LORD VISCOUNT NEVILL.

Dear sir,

I SHOULD not have neglected replying to your letter so long ; but I have been from home, and only returned yesterday, when I found your letter upon my table.

As to the admeasurement I will take that upon myself, and I only wish I had the power to take a drawing of the larger locust, for then I would send it you ; but I also believe, and understand with you, that MR. CROME excels in this branch, and I can only say I shall be most desirous, in every way, of facilitating the execution of it. Since it has been known that you have taken the trouble to come so far to see the locust tree, I have had a great many persons to visit it, many of whom live very near to me. Many also have been under it repeatedly, but, until now, never considered it in any other point of view than “ *a good looking tree from the house.*” Their attention is now directed to the subject, and the main object which you have had in view will, I have no doubt, be accomplished. I have at this moment a party staying in my house, and more coming in to-day, all of whom I shall request to peruse your highly

interesting and important papers. I think with you, that, in the larger tree, there is more stuff than we imagined ; and it should ever be borne in mind, that the smallest piece is of infinitely more value than the same quantity of any other wood that I am acquainted with. I speak of this *from experience*. It is so very hard, close, and durable, that those persons who are once acquainted with it are sure to select it where lasting materials are desired.

I will transmit you the size of the trees.

Signed,

NEVILL.

Bergh Apton,
July 28th, 1828.

No III.

Extract of a Letter from the REV. CALEB ELWIN.

Dear Sir,

I MUST beg excuse for not answering your enquiries sooner, and for the scanty information I can now give you. There are in the pleasure-ground at Melton only two old acacias.

One measured, at 3 feet from the ground, 8 feet.

The other, 6 feet 4 inches.

A large-branched cedar, at 3 feet, 10 feet 2 inches.

A straight-stemmed ditto, at ditto, 7 feet 9 inches.

A silver fir, at ditto, 11 feet 4 inches.

I have good assurance, that the cedars and silver fir were planted in 1764; but I am by no means certain that the acacias were not put in much later. In the shrubbery, on the north side of the house, there is a common acacia, measuring 14 inches; and another species with a faint blush-coloured flower, which measures 23 inches: these I know to be eleven years old. I fear in this communication there is nothing that will be worth your notice, for the age of the old trees is uncertain, and the two young ones never had common attention paid them. I scarcely know where it is most likely to find old acacias; but should think at Rainham, or Kimberley, or Narford, there is the greatest probability. I do not recollect any at Holkham. I think there is one of large size in the parsonage-garden at Spixworth, if still in being: it must have been planted somewhere about 1756.

Signed,

C. ELWIN.

Melton Constable, July 28, 1828.

No. IV.

Copy of a Letter from the late ROBERT ALDERSON, Esq.

Dear sir,

I HAVE employed a skilful valuer of timber, MR. WILLIAM BROOK, of St. Martin's Palace, Norwich, to overlook the locust trees, great and small, on my premises. He states their contents as follows.

- No. 1, 50 feet high, timber, 40 feet.
- 2, 50 feet high, timber, 30 feet.
- 3, 36 feet high, timber, 26 feet.
- 4, 50 feet high, timber, 20 feet.
- 5, 40 feet high, timber, 40 feet.
- 6, 40 feet high, timber, 40 feet.

All the above trees are in a thriving state; and, from the best information I can get, are none of them more than forty years of age.

I understand the term, *girth of a tree*, is the *fourth* part of what encircles it. I had thought it had been the *third*, like the diameter of a round. I hope the account I have sent you will be intelligible to you; but if it be not, you must

call the next time you come to Norwich, and look at the trees yourself.

Signed,

ROBERT ALDERSON.

Norwich, July 31, 1828.

No. V.

Extract of a Letter from ANTHONY HUDSON,
Esq.

Dear sir,

I BEG you will accept my thanks for your attention, in sending me your publications on planting. It is a subject which I have taken much interest in; and I have, for many years, watched with great pleasure the plantations at Holkham, which are the subject of your commendations.

MR. STANNARD has been with me this morning to measure the three largest acacias in my garden. I give you their dimensions. MR. STANNARD assures me that he, or any builder, would buy the three at three loads. I shall be happy to show them to you, if you will favour

me with a call when you come to Norwich. I have no means of exactly ascertaining their age; but I should think, from the time the house was built, and the garden made, by MR. MALTBY, that they must be between sixty and seventy years old. The largest acacia I know of is in MR. MICKLEWAIT's park at Taverham.

Largest acacia, 46 cubic feet.

Second, ... 38 ditto

Third, ... 33 ditto.

Signed,

A. HUDSON.

Norwich, Aug. 2, 1828.

No. VI.

Communicated by MR. W. O. BURTON, of Hedenham, Norfolk.

IN the spring of 1810, I planted a north border in my father's garden with evergreens and deciduous shrubs, for the double purpose of forming a pleasant walk, and being a shelter to the rest of the garden. In the spring of 1811, I obtained, from a gentleman in the next village,

two small plants of what was called the American acacia ; and although my border was then thickly planted, I put them in among the rest, under the idea of their being flowering shrubs. One of these plants I afterwards removed ; and the other, though it was crowded by neighbouring plants (particularly by a fine double-blossoming cherry), and was in itself little more than a seedling, in a few years surmounted all its difficulties, and is now a very fine plant of its age. I do not call it a *tree*, because, about six inches from the ground, it divides into two branches ; and these, after continuing nine feet and a few inches, are again subdivided into several branches each. Their separate dimensions and heights are as follows :

Branch 1. Circumference at 1 foot, 26 inches
at 3 feet, 22
at 6 feet, 19
at 9 feet, 17
Extreme height, 33 feet.

Branch 2. Circumference at 1 foot, 20 inches
3 feet, 17
6 feet, 15
Extreme height, 28 feet.

The other plant I removed, in the spring of 1813, to a village at some distance, and again planted it in a very unfavourable situation. It however succeeded beyond any of its fellows,

and is now much the finest tree in the place, though the dimensions are not worth recording, except that it is at least *double the height of the oaks put in at the same time*. It ought to be recollected, that when these plants were put into the ground, indeed for years after, the locust was unknown by name to me; and therefore not likely to receive any peculiarly favourable treatment, for the purpose of accelerating their growth.

Signed,

W. O. BURTON.

August 4, 1828.

No. VII.

Extract of a Letter from MR. BLAIKIE.

Dear sir,

I AM sorry it is not in my power to return the planting prospectus, and manuscript observations thereon. MR. COKE handed these to ADMIRAL WINDHAM when at this place. The ADMIRAL took the papers away with him, and has not returned them.

I find great difficulty in protecting young

locust trees from the ravages of hares and rabbits. Those animals prefer the locust to any other forest-tree. They could not have been so plentiful as they now are, at the time Mr. COKE reared the innumerable locust trees growing at this place. Those trees *thrive upon our most inferior sandy soils, where other forest-trees barely exist*. They, no doubt, thrive best upon good land, and so do other trees; but *they are inestimable* in the quality of thriving, where other trees will not grow. Spanish chestnuts thrive remarkably well here, upon medium soils, and come into use at as early an age as the locust. The chestnut is also more convertible timber for general purposes. We, therefore, plant a large proportion of chestnut on our best and medium soils. We do not succeed in raising locust plants from the home-grown seed, although it appears sound and well grown. There must be an error in our management, and we will try again.

Signed,

FRANCIS BLAIKIE.

Holkham, Aug. 8, 1828.

No. VIII.

Extract of a Letter from NATHANIEL MICKLE-
WAIT, ESQ.

Dear sir,

THE acacia at Taverham, I should conceive, from the ruggedness of the bark, and extension of limb, must be very old: it stands amongst some silver firs that contain, in each tree, near three loads of timber, and are all of them standing in what was, in my great grandfather's time, an ornamental grove. Its dimensions, if my people have measured it correctly, which they assure me is the case, are

Body, $74\frac{1}{2}$ feet

Arms, 15

Total, $89\frac{1}{2}$

Signed,

N. MICKLEWAIT.

Taverham, Aug. 11, 1828.

No. IX.

*Extract of a Letter from LORD WODEHOUSE,
then the Honourable COLONEL WODEHOUSE.*

Sir,

I BEG to return my best thanks to you for your letter of the 4th instant, and for your interesting publications on the subject of planting.

I have very few locust trees, but have long been convinced of the great value of the wood ; and have sent you, as you requested, an account of the quantity of timber contained in the largest locust in the Witton plantations. It contains 39 feet 7 inches, and I think it must have been planted about forty years. The soil was not prepared in any way for planting, except that of digging a small hole ; but it had been cultivated, and is of a middling quality.

Signed,

J. WODEHOUSE.

Witton, August 12, 1828.

No. X.

From MR WILLIAM PELL.

Sir,

ACCORDING to your wish, I have measured the acacia tree, at one foot from the bottom, which is the nearest point I could get at to make a fair measurement of it; for the ground has been lowered round it, and the roots lie very near. Its age is about 30 years, its height 40 feet.

Its girth at 1 foot up, 72 inches
3 feet up, 64
6 feet up, 62
11 feet up, 66

Eleven feet is the highest I could measure on account of the branches, which begin to shoot at that height. I have also measured the extent of its branches. At the widest part it is 40 feet. It contains $24\frac{1}{2}$ of cubic feet, allowing 1 inch for the bark, which is the custom of this part of the country.

Signed,

WM. PELL.

*Rainham near Sittingbourne,
August 27, 1828.*

No. XI.

*Extract of a Letter from LORD VISCOUNT NE-
VILL.*

Dear sir,

IN about ten days I hope to be at home, when I will have the trees accurately measured, and forward you the particulars. When I departed, the carpenters were about to make some alterations. There were then several slabs of the locust about, and I trust I shall find that they are not all used up. So satisfied are the workmen of its strength and durability, that I will not answer for their not employing it, should they require lasting stuff. Some time or other, I should be happy to show you the extensive plantations here, which have been all undertaken upon the *pitting system*. The land is much of the quality of that upon Holt Heath; and had the system you point out been followed years ago, they would now have exhibited a very different appearance. The information you have now sent me is of very great importance, and I shall take pains not to keep it to myself, as it is only by promulgating these valuable truths, we can hope to make an impression upon prejudiced minds. You have done much towards dispelling the doubts and fears which, for so long a time, have hung

over the minds and heads of most of our large planters, and I trust better things are in store.

Signed,

NEVILL.

Eridge Castle, Sept. 5, 1828.

No. XII.

Communicated by the late MR. MACKIE.

IN compliance with the request of JOHN SANDYS, I herewith send the dimensions of an acacia tree now standing in the nursery, which we suppose to have been planted about 47 years : it is

46 feet in height

18 feet to the first branch.

7 feet in circumference at 1 foot from the ground.

6 feet in circumference at 6 feet.

Although a well-grown single tree, and very handsome, I think the above dimensions, in this instance, do not indicate any extraordinary rapidity of growth. Many of the one year seed-

ling acacias, now upon the beds, are two feet high, and are still full of growth.

Signed,

GEO. MACKIE.

Nursery, Norwich, Sept. 5, 1828.

No. XIII.

From C. T. HIGGINS, ESQ.

Sir,

I RECEIVED your obliging letter, and assure you that it was no small disappointment to me not to find you at home, when I passed by your neighbourhood in August.

Having perused your late publication on the subject of planting, I was very desirous of being an eye-witness of the different modes which you yourself had adopted, with a view of rendering forest-planting a profitable speculation. I began to plant in this parish when very young, and my principal object was to promote the increase of game: profit certainly was the farthest from my thoughts. I always had, however, the ground dug two spades deep; but be-

ing of a clayey nature, the twitch and weeds have, in many instances, altogether impeded the growth of the trees: but an abundance of game has been the consequence; and having thus accomplished my first object, I became dissatisfied, and began to regret that so much ground was laid waste for such a purpose. About two years ago, it occurred to me, that it might be advisable to weed the young plantations two or three times during the summer; and I was astonished at the progress which these trees had made, in comparison with the others. It was only lately that I met with your valuable treatise, and was gratified to find that a principal feature in your plan was weeding; though, I confess, I never before could have imagined, that the expenses attending the laying on of manure, could be answered by the proportionate growth of the trees. It was this point which made me still more desirous to look over your plantations. With respect to the locust tree, in every instance where I have planted it, whatever may have been the quality of the soil, it *has so far outgrown any other tree*, that it has overshadowed several of its neighbours; so much so, that it has frequently been cut down to make room for those of slower growth, such as oak, ash, &c.: and this has been done under the supposition, that the acacia, when arrived at the state of timber, would be esteemed of little value. I have around my house some arid, scaly ground: on this the acacia is luxurious,

when others have failed altogether. I shall be anxious, should you put in execution your plan of publishing a treatise on this particular tree, to know your opinion as to the value of its timber, and to what particular purposes it might be more usefully applied. It is really the fact, that I have no tree that can be compared in growth with the locust; but it is more liable than any other, to have its branches broken with the wind.

Signed,

J. C. HIGGINS.

*Turvey House near Olney,
September 10, 1828.*

No. XIV.

Copy of Letter from MR. HEREPATH.

Dear sir,

A VARIETY of matters has hitherto prevented my thanking you, for the pleasure and information I have derived from the perusal of your works on the planting and culture of forest-trees, with which you had the goodness to favor me by our friend, MR. SMITH.

Your method of preparing the ground, by deep and wide trenching and manuring, is so perfectly conformable to nature and reason, that it really seems difficult to conceive how an opposite method could find advocates. It could only be on the uncertainty of living to enjoy the returns.

No doubt exists in my mind of the profitable success of your system. Were I to make any difference, it would be by exceeding you in liberality, in full confidence that, though distant, the repayment would be proportionably great. Reason would lead to the same conclusions that you have drawn, but you have pursued a much more safe and satisfactory course. By your numerous and varied experiments, your views are placed far beyond the influence of doubt. I cannot, however, help thinking, that certain concessions to your opponents are carried somewhat too far. It has been found that vegetables flourish for a period in nitrogen, that they absorb hydrogen, and evolve oxygen; but these circumstances, it appears to me, no more prove their deriving from these gases absolute nutriment, than that a man's being exhilarated by inhaling nitrous oxide, and his retaining the oxygen imbibed from the atmosphere, prove that such gases are his food. *Air* may possibly be as necessary for vegetables as it is for man; and it may be so for the same reason—as a medium of respiration: but until established by more

conclusive experiments, I cannot be persuaded that it forms, as you seem to admit, a great or the greater part of their nutriment ; or that trees derive substantive nourishment from any other source than their roots.

The permitting of grass and weeds to grow round young plants is really a very odd idea. Vegetables of all kinds, particularly the filamentous, are among the best radiators of heat ; that is, they become colder on exposure to the open air than most other bodies. This is known from the excessive dew on them in the morning, which is always proportional to the excess of cold sustained ; and from the trite fact, that grass is much colder at night than other circumjacent bodies, and very considerably (12 or 14 degrees) more so than the air six or seven feet above it. If, therefore, cold injures young trees, grass and weeds would be very traitorous protectors.

I beg to submit, whether you do not think it would be advisable to have the surface of the ground, during the first years of a plantation, kept in a light, loose state, by digging occasionally or deep hoeing. It is said that there is a combination between earth and air ; and practical men have assured me, that to turn up ground once or twice in very dry weather is equivalent to giving it a light dressing.

My experience in planting can add unfortunately nothing to your list of facts. However, I was informed some two or three years since, by a practical planter, that a most decisive demonstration of the wasteful economy of planting in small holes had occurred, in a neighbouring nobleman's estate. A number of trees had been thus planted, by a person who undertook to plant cheaply. In the same ground, and at the same time, my informant likewise planted a portion, having previously trenched deep and wide. Of the former numbers died, and the rest appeared so stunted, sickly, and languishing, in the course of a year or two, compared to the luxurious healthiness of the latter, that the proprietor ordered my informant to replant the whole of the other part after his own method.

There are now a few shrubs in a piece of ground in front of my house, which, about seven years and a half ago, were first planted over the lawn, in holes just large enough to thrust in the roots. They stood about a year, or perhaps two, in a very delicate, dwindling state. After this, I determined to remove them all to one spot for the purpose of hiding a ragged hedge. The holes (for they were again planted in holes) were dug very wide and deep; and the trees being put in, some earth was thrown round the roots, to the depth of perhaps eight inches, or a foot, or more. Each tree was then drawn up nearly to the top, shaking

it well in order to get the earth close round the small fibres ; and the process finished, in the ordinary way, by throwing in what remained of earth, and treading it. These trees have since flourished amazingly. Two of them, firs, are sixteen feet high, and twelve inches and a half round, one foot from the ground.

My attention has been so little turned to the strength of materials, that I fear I am not in possession of the best information. The latest abstract of facts is in the second and third volumes of *Hutton's Courses*, ninth edition. They are chiefly taken from BARLOW and TREDGOLD. It is, I believe, in general considered, that the tenacity, and therefore the strength of the locust, is about one-seventh greater than that of oak. If this be true, a beam of locust will support one-seventh more weight than a beam of oak of equal length, breadth, and depth ; or a beam of locust will support the same weight as a beam of oak of the same length and depth, and one-seventh greater breadth. These are, however, but mere approximations ; and it would probably be a waste of time to attempt to come nearer the truth, without the experiments were made under more satisfactory circumstances. The permanent strength of any wood seems not to be above half its registered value. This being more or less taken into account, may be one cause of the anomaly in different writers.

I am not acquainted with the properties of locust wood ; but from your description, I should conceive the cultivation of it, in such a nation as ours, to be an object worthy of the highest attention and encouragement.

My best and warmest wishes attend your laudable and patriotic undertaking ; and that you may live to enjoy the full and ample reward of your labours, is the unfeigned hope of,

Signed,

J. HEREPATH.

Cranford, Sept. 11, 1828.

XV.

Communicated by T. T. VALLANCE, Esq.

Sir,

I MUST beg your acceptance of my thanks for your works on planting, which have afforded me much pleasure in the perusal. Absence from home has prevented me, and also the friend to whom I transmitted them, from writing to you sooner.

As my friend has himself taken much interest in planting, and in all kinds of agricultural pursuits, I transcribe his letter to me on the subject, which I hope will be interesting to you.

My dear friend,

I HAVE taken the dimensions, according to the plan in MR. WITHERS' book, of ten trees and of different sorts, they all being of the same age, having been planted in 1811.

No. 1. *Acacia.*

Inches round at bottom, ..	40
One foot above, ...	$35\frac{1}{2}$
Six feet high, ...	33
Height, 24 feet.	

No. 2. *Acacia.*

Inches round at bottom, ..	$29\frac{1}{2}$
One foot above, ...	$26\frac{1}{2}$
Six feet high, ...	24
Height, 34 feet.	

No. 3. *Scotch Fir.*

Inches round at bottom, ..	$37\frac{1}{2}$
One foot above, ...	$33\frac{1}{2}$
Six feet high, ...	$27\frac{1}{2}$
Height, 32 feet.	

No. 4. *Elm.*

Inches round at bottom, ..	28
One foot above, ...	$23\frac{1}{2}$

Six feet high, ... 17
 Height, 32 feet.

No. 5. *Ash.*

Inches round at bottom, .. $31\frac{1}{2}$
 One foot above, ... $25\frac{1}{4}$
 Six feet high, ... $19\frac{3}{4}$
 Height, 33 feet.

No. 6. *Elm.*

Inches round at bottom, .. 30
 One foot above, ... 24
 Six feet high, ... $17\frac{3}{4}$
 Height, 33 feet.

No. 7. *Ash.*

Inches round at bottom, .. 36
 One foot above, ... 30
 Six feet high, ... 24
 Height, 34 feet.

No. 8. *Scotch Fir.*

Inches round at bottom, .. 40
 One foot above, ... 33
 Six feet high, ... 23
 Height, 34 feet.

No. 9. *Acacia.*

Inches round at bottom, .. $31\frac{1}{2}$
 One foot above, ... $28\frac{1}{2}$
 Six feet high, ... 23
 Height, 33 feet.

No. 10. *Larch.*

Inches round at bottom, ..	47
One foot above, ...	$37\frac{3}{4}$
Six feet high, ...	$27\frac{3}{4}$
Height, 36 feet.	

With regard to the durability of the acacia wood, I have found on using it, when about the size of a stake, that it possessed nothing beyond the oak or beech of the same dimensions. The *sap* of the acacia appears to be equally as rapid in decay as that of the oak. I have not had sufficient trial of the *heart* of the acacia to give an opinion. I have greatly to thank you, my friend, for the loan of MR. WITHERS' books: his opinions and systems on the raising of trees perfectly coincide with my own; and I flatter myself that he would not be displeased in reading my publications on the *Principles of Agriculture*, as he would there meet with a system, which equally advocates the necessity and advantage of the fallow, and manure, to all arable lands.

I ought here to state, that the trees, whose dimensions I have given, grow in a fertile sandy loam, with chalk about twenty or thirty feet beneath.

Signed,

WM. BLAND, JUN.

Hartlip, Sept. 10.

I now send you the dimensions of two trees, one of which you alluded to, taken by a timber-measurer.

Planted in 1812.

No. 1. Height 32 feet, and the contents 5 cubic feet. The body of this tree is not more than 2 feet high, and as such its principal contents are in its limbs.

No. 2. Height 30 feet, and the contents $7\frac{3}{4}$ cubic feet: its body 7 feet high. It would have produced more timber, had it been trained for that purpose instead of appearance only.

The two last trees grow in a sandy loam, and the most valuable brick-earth, twenty feet deep.

If it be in my power to render you further information, I beg you will not hesitate to apply to me.

Signed,

T. T. VALLANCE.

Sittingbourne, 11th Sept. 1828.

No. XVI.

THE admeasurements of the eight trees which

follow were communicated to J. MATCHETT, ESQ. of Lakenham near Norwich, by the late MRS. CROWE. The trees are growing at Lakenham.

	<i>Length.</i>	<i>Girth.</i>	<i>Contents.</i>
No. 1, ...	9 — 15	— 14	0
	14 — 9	— 7	10
bough,	9 — 9	— 2	6
2, ...	8 — 12½	— 8	8
	20 — 8	— 8	10
3, ...	24 — 10½	— 18	4
4, ...	14 — 9½	— 7	0
	6 — 6	— 1	6
5, ...	15 — 11	— 12	7
	8 — 6	— 2	0
bough,	6 — 6	— 0	9
6, ...	14 — 13	— 16	5
7, ...	18 — 10½	— 13	9
8, ...	12 — 8½	— 6	0
	12 — 7	— 4	1

Feet 124 · 3

MRS. CROWE begs to present her compliments to MR. MATCHETT and family: is sorry she cannot accurately ascertain the age of the largest of the locust trees, but believes it to be about thirty-five years. She has, therefore, caused others to be measured, and those numbered 4 and 5 she knows to have been planted in the year 1807.

September 16, 1828.

No. XVII.

From JOSEPH MUNDAY, ESQ.

My dear sir,

I HAD a long conversation with the very scientific operator at our Botanic Garden, who unfortunately had not made dendrology his study. He showed me all the acacias in the garden. The largest was about the size of the one planted by our friend ROBERSON, about twenty-two years ago, or probably not quite so long. They are about forty feet high, and three in girth. MR. HENRY PARKER has about forty young trees, which he had of MR. COBBETT. They are in a flourishing state. After the receipt of your second letter, I went over to Blenheim, and saw the Duke, who told me there were a great many trees in his park and pleasure-grounds. His Grace spoke in high terms of the utility and value of the wood. With the greatest kindness he ordered his servant to attend me through his private gardens, which are strictly kept from the view of all persons, who have not received his permission to visit them. There I saw several acacias, particularly a very fine one about three or four yards in girth, and very lofty. I lent the Duke your last publication; and he requests that I would say, he has given orders that you should, in his absence, be per-

mitted to go through his private grounds (a perfect paradise), and his *Arboretum*. He is extravagantly fond of botanic studies, and botanic labour; and I am certain would, with the greatest pleasure, correspond with you on the subject of the locust trees. If you have copies of your books to spare, you will probable send a set to his Grace. He is kind, intelligent, and communicative in the extreme, on matters of this nature. He spends most of his time in actual labour, and has himself planted many thousand trees. White Knights, near Reading, the most beautiful garden and plantation in the kingdom, was planned and planted by himself.

I have made many enquiries concerning the locust tree, but can procure little information on this subject from our Oxford gardeners, who appear to pay very little attention to planting any thing but cabbages.

Signed,

J. MUNDAY.

Oxford, October 5, 1828.

No. XVIII.

Extract of a Letter from ROBERT RICH, ESQ.

Sir,

IN the spring of 1824, I planted nine hundred acacias, four feet apart, on the plan suggested by MR. COBBETT, which will be felled this season and put to use in the hop grounds. They average thirteen and sixteen feet. Pleased with their progress, I planted nine hundred more in 1826, and in the last spring, 1828, I had three thousand planted; which, except the first, were raised here from seed. These small experiments are so flattering, that I have not any difficulty to *prove* that land, of *second rate* quality, as well as inferior, cannot be applied to a more profitable purpose. It was at my suggestion, that MR. RILEY, my brother-in-law, had the table and other articles of furniture made up from the acacia tree. I allude to that which, I am informed, you saw at Abbey-House, Bermondsey.

Signed,

ROBERT RICH.

*Oversland Cottage, near Feversham,
Kent, October 8, 1828.*

No. XIX.

From PROFESSOR BARLOW, *addressed to* COLONEL JONES *of the Royal Engineers.*

Sir,

As you wished me to give you the result of the experiments made on the strength of the two specimens of acacia, which you witnessed this morning, I beg to state, that the dimensions, weight, and comparative strength, with reference to other woods, are as below.

Length of each piece 5 feet, by two inches square—weight of each 98 ounces, which makes the specific gravity 710, that of oak varying from 720, when well seasoned, to 1074 when first felled. These pieces were supported on props 50 inches distant, and the load was suspended from the centre.

Specimen, No. 1, carried 1084lbs., when the rope broke. The piece appeared to have sustained little injury, and it was thought proper to preserve it in that state.

Specimen, No. 2, was suspended in like manner, and was broken by a weight of 1195lbs.

Reducing this by the formula given in my *Treatise on the Strength of Timber*, the num-

ber expressing its strength is 1867, by means of which it may be compared with the strength of various other woods, whose comparative strengths have been obtained by the same formula, the specimens being nearly of the same size as those tried this morning, and selected for my experiments from the stores of his Majesty's Dock-Yard, Woolwich.

	<i>Comp. Strength.</i>
Teak	2462
Poon	2221
Very fine English oak	1672
Mean of other specimens of oak	1535
Ash	2026
Beech	1556
Elm	1013
Pitch pine	1632
Red pine	1344
Fir, New England	1102
Fir, Riga	1108
Fir, forest	1144
Medium larch	1000
Norway spar	1474
Acacia by our experiment	1867

The specimen which was not broken was decidedly the best, and would certainly have given a greater number.

Signed,

PETER BARLOW.

Royal Military Academy, Woolwich,
October 11, 1828.

No. XX.

From SIR JOHN THOMAS JONES, BART.

Dear sir,

I HAVE the pleasure to forward you a paper, containing the details of a trial of the strength of the locust wood which you sent me, made by Mr. P. BARLOW, who has written so ably on the strength of timber, and who carried on a course of experiments in the Dock-Yard and Arsenal, at this place, some little time since, by authority.

The result of the trial is highly favorable to the locust wood; and both sticks are so little injured by the weight they supported, that I have thought right to preserve them, and will bring them with me into Norfolk, that you may have the satisfaction of seeing them.

Signed,

JOHN T. JONES.

Woolwich, October 13, 1828.

No. XXI.

Communicated by MR. WILLIAM KEDIE.

DIMENSIONS of an acacia tree growing in Mundford Nursery, Norfolk.

	<i>ft.</i>	<i>in.</i>
Girth at the bottom, ...	6	6
One foot from ditto, ...	6	4
Six feet from ditto, ...	4	10
Twelve feet from ditto, ...	5	3
Extreme height, 42 feet 6 inches—age about 30 years.		

Two limbs, 8 feet long each.

South limb, 3 feet 8 inches in girth at bottom,
3 feet 1 inch at top.

North limb, 3 feet 3 inches in girth at bottom,
2 feet 9 inches at top.

Mundford, November, 1828.

No. XXII.

Communicated by MR. LANCELOT REED.

Dear sir,

I AM fearful you will have thought me inatten-

tive, in not having attended to your letter sooner. I have repeatedly applied to the Livermere gardener, but only succeeded in getting the enclosed dimensions of two locust-trees there yesterday. I sent his Lordship's carpenter for the express purpose, and the enclosed, is what he gave to me, which, I believe, may be relied upon. We have none at Ampton that will measure so much.

Signed,

LANCELOT REED.

Ampton, December 4, 1828.

Thorn Acacia.

One tree, measured over the bark, including all the limbs that are measurable, contains 41 feet. Another, 72 feet. Age, 38 years.

No. XXIII.

From PHILIP JAMES CASE, ESQ.

Sir,

A FEW days since I received a letter from MR. C. POPPY, of Witnesham, requesting me to furnish any information in my power relative to the

growth and properties of the acacia tree. Having a few years since observed MR. COBBETT's papers on the subject, I made enquiries and observations, and immediately obtained about one hundred plants from him, some of which I gave to four or five friends in the neighbourhood. I planted two in my garden at Bury, where they have made great progress; but I find they have to encounter many enemies, none greater than the wind. Though I have taken off every year the side-shoots close to the stem of two years old, and shortened those of the previous year; still that has not been sufficient to prevent the wind, when the leaves are on and heavy with wet, from tearing the boughs, though only of the last year, from the main stem, and nearly spoiling the plant. The mould of my garden is not very good, and the chalk is within two feet and a half of the surface; but the trees have grown four or five feet in height in a year. The plants from MR. COBBETT, I understand, are the pseudo acacia, or No. 13, if my recollection is correct, said to be somewhat different from that commonly cultivated in gardens. There are two of very large size growing in the garden of CHARLES BLOMFIELD, Esq., the father of the BISHOP of LONDON: they are six or eight feet round, at four or five feet from the bottom, and are at least fifty feet high to the top boughs. I tried a small bough: the wood is equally heavy as from the trunks of other large trees. I use one as a paper-cutter.

Wishing, by use, to try the wood when large, for purposes of strength, I obtained some boards from his Grace the DUKE of NORFOLK; and had spokes and felloes made of this wood, about a year since, and they stand very well. I obtained pieces for naves; but, when trimmed up, they split from the strength of the wood. I have also a chair made of the same wood. The wood from MR. BLOMFIELD is rather a *deeper yellow* than that from Fornham, or St. Edmund's Hill, near Bury. Those at St. Edmund's Hill are in plantations; and some of them, together with those at MR. BLOMFIELD'S, were brought from abroad by ADMIRAL SYMONDS, brother to our late Recorder, between fifty and sixty years back. They are upon a strong clay soil, and in plantations. Many of them seem to be in a state of decay towards the bottom, which seems to run up the heart; and when the board is cut, they fly open. Those at Fornham are now about fifty years old, some of them good-sized trees for plantations, three, four, or five feet round. Hares and rabbits are very destructive to them, and snails particularly so, appearing to devour the outer bark off the tree, much to its injury.

I observed at Hargham, that SIR THOMAS BEEVOR had planted a great many. They appeared unattended to, and had not made great progress. Those I planted in a good soil at Rougham are completely destroyed by game.

Of those I gave MR. WIGSON of Horsecroft, and planted on a good soil, and at different places, not five are alive. Those I gave Mr. BLOMFIELD are thriving; but I am satisfied they want constant pruning, and to be in plantations with other trees, but not too thick, to preserve them from the destructive effects of the wind.

I cannot answer the questions proposed by MR. POPPY. Posts of them have been put down in the fence round the Duke's park, and remained sound; but the carpenter could not tell me when they were taken down, or put into the ground—probably ten or twelve years, but I fancy they would be durable for a longer period. I saw some fine ones taken down at Barton Mills, near Mildenhall, perhaps six to seven feet in circumference. I was to have had some, and will make further enquiry about them: they appeared generally sound. I think they prefer a rather light soil. MR. HOLMES of Bury has planted at Kentford, near Newmarket, some thousands, on a light soil: I have not seen the plantations, but am confident they will not answer well *by themselves*, or when *too thickly planted*, and the game has made great destruction.

Signed,

PH. JAS. CASE.

Bury St. Edmund's, Jan. 10, 1829.

No. XXIV.

*Extract of a Letter, dated Oversland Cottage,
Kent, March 6, 1829.*

Dear sir,

I REGRET much that I have hitherto been deprived of the opportunity to obtain the information you ask, as to the growth of the locust in various parts, but will shortly exert myself. I presume that you are aware of the numbers growing about the royal gardens at Kew. I am told there are many about Isleworth, Twickenham, and Hampton Court. I sent a man to examine some spars, cut from locusts growing in a pleasure-ground adjoining a brick-yard at Feversham, where they are used against posts of oak, some of which posts are rotten through, while the locust spars are hard as iron. The occupier, MR. JAMES KNOWLER, sent me a written particular, extracted from his day-book, of a locust grown in Feversham, certified to be planted forty-one years only : it measured, when taken down, two tons, one foot. The poles I described to you are cut. I regret that my man had them all shaved, as others are, previous to use. They are put into the hop-ground. For poles of ash, willow, and chestnut I pay twenty and twenty-eight shillings per hundred in the woods—carriage about four shillings per

hundred, according to distance. I have been trenching some land two feet deep, which, for soil and situation, was really worthless: it is the outside and irregular part of common-land, which the LORD PARAMOUNT SONDES permitted the poor to inclose. This part they refused, and at Michaelmas last I made entry of it, about an acre; and I had another acre conveyed to me by feoffment for £10, which the poor man found of no value. These plots I have intended to plant with locust, and am anxious to do it this spring; but I fear whether it is sufficiently settled down. Being anxious for the success of the undertaking, I must consider whether I ought not to wait till the autumn, or next spring. Attentive drainage is very requisite, which the state of the adjoining land renders more difficult. Should this plantation succeed, a comparison with the drowned woodland, and its stunted produce, will, I trust, show the locust to advantage, establish the utility of trenching, and be an astounding argument in favour of such profitable employment for the labourer. Six acres of the underwood adjoining, of fifteen years' growth, was valued to me last year at £5 per acre (all it proved worth) by the Steward of St. John's College, Cambridge. It is mortifying to observe the state of church and college property (of which there is much in this neighbourhood), so ruinously neglected, while the property and re-

venues from it might be so advantageously, and usefully improved.

Signed,

R. RICH.

No. XXV.

Communicated by DR. INMAN.

Dear sir,

I AM sorry that I can give you no information respecting the size to which the locust tree grows in this part of the country : indeed, I am not aware that it is grown at all. The wood has been used for tree-nails in this dock-yard for one small vessel only, but I do not know that any report has been made of its comparative value for this purpose. A few tree-nails made of the wood were driven a day or two ago, under the immediate inspection of a perfect judge of these matters ; and he says, they appeared to him to be much superior to oak tree-nails : they seemed very rigid, and less likely to split in the fibre.

By experiments made in this yard, it appears that the lateral strength of this wood in

resisting fracture is greater than that of oak, in the proportion of 1 to 0.75.

I am quite convinced of the truth of your observations respecting the planting of oak, both as to the propriety of preparing the immediate spot for the young trees, and of a general preparation, in draining, &c., of the intermediate ground. I think none can walk through the forests in this neighbourhood, without at once wishing for the adoption of your plan. You may see here acres on acres of miserable oaks, some crowded together, some at too great a distance, some in swamps, some in impenetrable stuff; while, on stepping out of this plantation of British oak, you may see in Sussex fine trees, in hedge-rows, &c., where the ground has been attended to for other purposes.

Signed,

J. INMAN.

Royal Naval College, May 12, 1829.

No. XXVI.

From SIR ROBERT SEPPINGS.

Sir,

THE excellent properties of the locust tree, for the tree-nails of ships, have long been known and appreciated in this country. I have now before me the result of some experiments made upon the comparative strength of this wood, as far back as the year 1789, in Deptford Yard, and the following are the results :

<i>Species.</i>	<i>Weight.</i>	<i>Each piece</i>							
		<i>supported</i>				<i>broke with</i>			
	<i>lb. oz.</i>	<i>cwt. qu. lb. oz.</i>				<i>cwt. qu. lb. oz.</i>			
1. Nova Scotia wood	1 3	1 0	6	10		1 0	7	10	
2. ditto	1 2	1 1	1	2		1 1	2	2	
1. Locust	1 4 $\frac{1}{2}$	1 3	9	2		1 3	10	2	
2. ditto	1 3 $\frac{1}{2}$	1 3	20	2		1 3	21	2	
1. English oak	1 3	1 1	0	2		1 1	1	2	
2. ditto	2 2	1 1	5	2		1 1	6	2	

The pieces were two feet four inches and a half in length, and one inch and two-tenths square.

The experiment was not conducted in the best manner; but still each piece was tried in the same way, and therefore a comparison may be drawn.

One end of each was introduced for four inches into a post made to receive it. At two feet from the side of the post was hung a beam, to receive the weights, which were gradually placed thereon till the pieces were broken.

There is a very interesting account of the acacia tree in DR. HUNTER'S edition of EVELYN'S *Sylva*, 4to, vol. 2, page 68, which will give you much valuable information. Some of this species of trees, I am credibly informed, were grown many years since in the King's Forest, called the New Forest.

I am much obliged by your offer of some plants, and only decline them because I have no land on which to plant them.

I have been to MR. COBBETT'S, No. 183, Fleet-street: the specimens of wood mentioned by you are not there. I however saw a piece of the American locust tree, which had been for years in use as a post, and which now appears to be sound. We have, for the last two or three years, imported a considerable number of locust tree-nails from America.

Signed,

ROBT. SEPPINGS.

Navy-Office, June 9, 1829.

No. XXVII.

Extract of a Letter from CHARLES BLOMFIELD,
ESQ.

Sir,

I HAVE not been able to get my carpenter to give me the measurement of the acacia trees until yesterday, or I should earlier have answered your queries.

The trees have been planted, in rather a confined garden, about sixty years. Their height is from 40 to 50 feet—the cubical contents of the largest tree are 54 feet of timber—circumference (three feet out of the ground), 6 feet, 7 inches. Two other trees, in the same situation, are not quite so large, and one of them seems decaying. An arm of the largest tree, cut off some years since, I gave to a cabinet-maker, who sent me a paper-cutter, made of part of it, which answers the purpose extremely well as to hardness, but bears no particular polish. I cannot speak to any other qualities of the wood.

Signed,

CHAS. BLOMFIELD.

Bury St. Edmund's, June 24, 1829.

No. XXVIII.

Extract of a Letter from W. P. SHIRLEY, Esq.

My dear sir,

I RECEIVED your polite letter, for which I beg you will accept my best thanks. Upon enquiry of one or two persons, of from thirty to forty years experience in timber, both of quick and slow growth, and constantly in the habit of using both sorts in a variety of ways, I find they are decidedly of opinion, that timber of quick growth is the best for all purposes that they are acquainted with, after it has attained a proper age: and they have no idea that it is more disposed to decay, than timber of slow growth: it is also decidedly tougher, and stronger, and worth more money. I recollect a circumstance of two ash trees, which I cut down with others that injured a young fruit-plantation. One was a small old tree, and the other a fine, fast-growing tree in its prime. I had two benders cut from these trees, for a cross-bow, of equal length and size, for my son; and found that the bender from the old tree would not carry an arrow so far as the other, by a long distance. I then intended to make some further trials in the same way, but neglected to do so.

I have two oak trees that an old servant re-

membered young, and nearly of a size. Some years back the outrunnings of bushes were grubbed up; and one of the trees now stands out in the meadow, at a short distance, and is nearly a third larger than the other, which is still surrounded with underwood. This difference in growth appears to be in consequence of the one in the meadow receiving a considerable quantity of manure, from the stock constantly resorting there, it being a dry warm spot. I am sorry to say, I know, from sad experience the folly of planting after the *cheap Scotch system*; but I do assure you I am *quite cured* of it. My tenant has taken up eight or nine acres that I planted a few years back, and is at this time taking up thirteen more, that have entirely failed, although planted with fine young plants; when there is another piece planted since, upon the principles laid down in your valuable treatise, which is now from fifteen to twenty feet high, without a dead plant upon the whole piece. A farmer, next to my tenant, planted a long slip, and a poor man cultivated about half for vegetables: that part I saw yesterday is fit to cut down for hop-poles, and the other part is about the same as when it was first planted, except being unhealthy and overgrown with moss.

The locust trees I planted in 1825, and cut off in the spring of 1826, I find as follows: the highest 25 feet, and 11 inches girth 2 feet from

the ground ; the others from 20 to 24 feet high, and in girth from 8 to $9\frac{1}{2}$ inches. Many have been injured by the storms in summer. I saw several oak trees, planted about 56 or 60 years back, in a piece that was a garden : they are, I think, about 70 feet high, and girth about 5 feet 9 inches, in some of them 6 feet. Some others were planted at the same time on uncultivated land, which are about 50 feet high, and from 5 to 5 feet 6 inches in girth. These are on equally good land, but had not the early cultivation, although they had equal care in other respects, being in a park.

Signed,

W. P. SHIRLEY.

Sutton Valence, Dec. 29, 1829.

The letter which follows contains information of peculiar interest. The original was received from M. MILLER, late Editor of the *Journal des Forêts*, a work which it appears, is now discontinued. M. MILLER, there is reason to fear, fell during the memorable "three days" of July, 1830. The translation is by a lady at Holt.

No. XXIX.

*Administration du Journal des Forêts, Rue Louis
le Grand, Paris, July 7, 1830.*

Sir,

I HAVE received with lively pleasure your letter of the fourteenth of June last, as well as the copy of the DUKE of PORTLAND'S letter, which has proved to me, that, in England, they are more desirous to do justice to useful and important works than in France. I have also received, through MESSRS. TREUTTEL and WURTZ, your two interesting pamphlets; and beg you to accept my sincere thanks. I shall not fail to make use of them for our collection.

I have communicated your letter and your packet to my coadjutors, who are extremely delighted with them, and beg me to express to you the lively satisfaction they experience, in commencing a correspondence with a person like yourself, sir, who has already done so much for the advancement of one of the most important parts of rural economy. I have the honour to transmit to you, by MESSRS. TREUTTEL and WURTZ of Paris, the two first volumes, and the first and second numbers of the third volume, of the *Journal des Forêts*. This collection, which is particularly dedicated to our great

forest-proprietors, may eventually become useful, being especially intended to register all the observations, facts, and important discoveries, that have occurred in forest-economy. Should you hereafter judge it worthy your attention, I shall beg you to make it known to those of your countrymen, whom it would perhaps interest. I must, for the present, confine myself to the following observations, in reply to the questions you addressed to me respecting the acacia; but at a future period I will endeavour to communicate to you the most exact intelligence which I may be enabled to procure. In France and in Germany, this tree has been the subject of numerous publications, most of which have exaggerated its qualities. The consequence of this has been, that, having been too much extolled, it has afterwards fallen into disrepute. It has been acknowledged, that advantages and disadvantages are attached to its propagation; the former, however, outweigh the latter. The tree, therefore, certainly deserves to be more generally cultivated than it is, in our southern departments.

Amongst the eleven species that we possess, the *White Acacia*, usually styled *Robinia*, or *Faux Acacia* (*Robinia pseudo Acacia*), is the only one which can be really serviceable in our forest-culture. The others are only useful in the *decoration* of parks and gardens.

Soil. It is not the fact, that all soils suit the acacia. It appears certain, that it does not prosper in the north; neither in sandy, dry, and barren earth; nor in marshy ground. A soil of light white sand, where the maritime and wild pine and birch succeed, is not adapted to it. The numerous plantations of acacia that have been made in masses, during seven or eight years, in the flinty sand of the *Bois de Boulogne*, near Paris, which at first displayed an astonishing luxuriance of vegetation, have lost their vigour, in proportion as they arrived at the age of five or six years.

The acacia supports itself best when planted in single rows, because the plants have more air, and their long and wandering roots find more nutriment, than when the young plants are crowded together in coppices. However, M. HOTTEN, one of our most skilful coadjutors, has seen, in the Park of Boulogne, the stems of young acacias of seven months' growth, which were more than twelve feet high, and four inches in circumference at the base; but he observed, that these trees were in a damp situation, a rare thing in this park, of which the soil, generally, is some of the poorest that can any where be found.

This clever experimentalist thinks, that the acacia may also succeed on such land, when the precaution has been taken to sow it in fur-

rows of a certain depth. A light, yet substantial soil, such as a fertile sandy loam, is that which suits the acacia best: it there vegetates with such rapidity, that, in its growth, it makes shoots which are sometimes six feet high. It is necessary to avoid planting it in places exposed to the violence of the wind, which splits its branches. The acacia also makes rapid progress on the banks of ditches.

M. MICHAUX, in his *History of North American Trees*, observes, that the dimensions of the acacia vary much, according to the nature of the soil, and the temperature of the climate. Thus, in Pennsylvania, between Harrisburg and Carlisle, under the latitude $40^{\circ} 21'$, also along the banks of the river Susquehannah, where, in passing from north to south this tree first makes its appearance, it is much shorter and of less dimensions than farther on in Virginia, and above all in Kentucky and West Tennessee, which are situated three or four degrees more to the south, and where the soil is much more fertile. It there acquires from three to four feet in diameter, and a height which sometimes exceeds seventy or eighty feet; whilst, on this side of the mountains, its dimensions are scarcely half so considerable.

In France, and especially in the environs of Paris, its average height is from forty-five to sixty feet. I do not know whether the acacia

succeeds well in England; but it is certain, that, to vegetate well, it requires a mild, or at least a temperate, climate. In cold countries it does not prosper. Its young shoots are frozen to the half of their height, and they split from the weight of the snow and hoar frost. The climate of Paris, even, is a little too cold for this tree: but the further we advance towards the south of France, the stronger the acacias appear.

Considerable plantations of them have been made in the neighbourhood of Bourdeaux, where M. CAMBON, a landed proprietor, met with complete success in 1810. He planted 14,600 acacia plants, upon a barren and ferruginous soil, which have succeeded perfectly, and have obtained for him honourable mention in the Society of Encouragement. A planter in the south (department of Tarn and Garonne), measured in 1825, in a nursery-ground, some young acacias that were sown the preceding April, which were nine feet high, and one inch in diameter at their base. The average height of the other trees of that sowing was from five to six feet. This luxurious vegetation has not proved in the least detrimental to these shrubs, even when they were planted into a different soil.

Use. In France, the acacia is generally employed to decorate groves and pleasure-grounds:

also to form walks, quincuncs, and groups in landscape-gardens ; but I am not aware that there are any forest-plantations of acacia, for the express purpose of raising timber, for carpenter's work, and ship-building.

Impenetrable inclosures are formed of it, and its twining roots are useful to mat the earth and prevent its crumbling away ; but this very quality renders a plantation of this tree injurious to neighbouring crops under cultivation. A method that is employed with success in forming enclosures, with a view to give vigour to the young plant, and cause its root to take firm hold of the soil, is to cut it down, or, if I may so speak, mow it level with the ground for the two first years.

The acacia is cultivated also in the form of low bushes (*tetards*), of which the leaves furnish excellent fodder for cattle. As its wood is almost incorruptible, and hardens with time, it is generally used for stakes, posts, hop-poles, and above all for vine-props in our vineyard-countries ; though, in fact, its utility for these purposes is not universally appreciated, as it deserves to be. The wood of the acacia is hard, compact, and susceptible of a beautiful polish. It has also great strength, but possesses little elasticity. It is tolerably good for fuel ; although in this respect its qualities, for want of sufficient experience, have been over rated.

M. HARTIG, superintendant of the forests in the kingdom of Prussia, who has acquired so great a reputation in Europe, by the accuracy and precision of his experiments, has discovered that the comparative value of the acacia, for fuel, was to that of the beech as 12 is to 15. For duration, the same author places it immediately after the oak, and before the larch and the Scotch fir, *pinus sylvestris*, which, amongst the resinous woods, are those that last the longest under water, or when let into the ground. M. MICHAUX says, that in America acacia wood is cut into posts, for the enclosure of courts, gardens, and farms; and it is considered, that these posts, when used in a very dry state, last about forty years. In the United States, the wood is employed for ship-building, when curved timber of suitable dimensions can be procured; but it seems they are chiefly used for making pulleys or blocks, and pins, to fasten the cordage to the timber-work of ships.

The American cabinet-makers, it appears, prefer the acacia to the other woods of the country. In Paris, they make many little knick-knacks, such as boxes, salt-cellars, sugar-basins, candlesticks, spoons, forks, &c., of it.

The acacia produces a yellow dye, which may at a future day, perhaps, be successfully applied. An agreeable syrup is made with its

flowers. M. ROLARD, Sen., a distinguished agriculturist, is the first in France who discovered, after numerous experiments, the advantage that may be obtained in the cultivation of the acacia, by sowing it very late in the year. By this method the seed germinates with great facility, and vegetation increases rapidly.

You will also find a short article upon the acacia, vol. 2, page 19, of the *Journal des Forêts*. Amongst the most modern writings on the acacia, which are worthy to be consulted, I can refer you to the following French works: viz. those of M. M. BOSC MALLET, MICHAUX, and F. DE NEUFCHATEAU. The last-named author has contributed above all, to promote the cultivation of this precious tree in our southern departments. In Germany, there are the works of M. M. HARTIG, HESS RUCKERT, SEYLER, and above all of M. LE CONSEILLER MEDICUS, who has written a work, in 3 vol., entitled, *Unachter Acacienbaum zur Ermunterung des Allgemeinen Baumes derselben Holzart—Manheim, 1803—Wienbrack*.

I am not acquainted with MR. COBBETT's account. Will you, sir, acknowledge the receipt of the packet which I announce to you, and which ought to leave Paris this week, in order that I may enquire for it in case you do not receive it in time. Accept the assurance of the

distinguished consideration with which I have the honour to be,

Your very humble and obedient servant,

MILLER.

The following most important communication from the late LORD KING is retained entire. It contains particulars that certainly do not refer to the acacia only ; but they are too valuable to be lost sight of, and the public will doubtless estimate them according to their worth.

No. XXX.

Dover-Street, April 3, 1832.

Sir,

I RETURN my best thanks, for the opportunity of looking over the very excellent directions for pruning and managing young plantations ; and I will return the manuscript to you, as soon as it is copied out. Nothing can be more judicious than the directions contained in it. Allow me to ask, whether you are aware that the middle of summer is the best time for cutting off very *large* branches (when unfortunately that is ne-

cessary to be done), as the tree is at that time of the year in health and vigour, so as to enable it to heal over the wound before the wet and cold of winter. When I say the middle of summer, I mean the month of June, or early in July, between the spring-shoot and midsummer-growth. I have two or three very large acacia trees, one of them I think about seventy or perhaps eighty years old ; but it has not grown, at least not perceptibly, for several years. I do not think it ever grows to very large timber in this country, but it soon acquires a certain size : it seems too much disposed to make a head, and to divide into, at least, two large branches, to allow any great number of cubic feet to be formed in the main trunk. You will say, that timely and judicious pruning and training will correct this defect : it will so, if it be the nature of the tree to attain very large dimensions, but perhaps not otherwise.

As to the quality of the timber, nothing can exceed it. It is of a most beautiful yellow colour, of the hardest texture ; and every one knows that it endures, as posts, longer than oak, or any other wood, except yew ; but it is not as well known, that it never breaks to any strain. I can give you an instance in proof of this. We are in the habit of using a machine, called with us the *hoisters*, for bringing home large trees without any other tackle. The axle-tree is always made of the best ash ; and yet

mine never lasted more than two years, without being broken by the strain of lifting trees from the ground, occasioned by the sudden force when the pole turns over.

About twenty-five years ago, my carpenter put in an acacia axle, which lasted eleven years, and then was as sound as it was the first day; but as the wheels were worn out, the carpenter thought it best to put in another acacia axle, as some of the pin holes were a little worn, and I believe that axletree now remains in use. As soon as I return into the country, I will send the girth and measure of my trees. *They require a good garden-soil to attain any size.*

Signed,

KING.

No. XXXI.

Ockham Court, May 7, 1832.

Sir,

I PROMISED that, when I came here, I would send you the particulars of an acacia tree, which is as large as any one I happen to have seen. I cannot tell the age of the tree, but I *guess* that it

is near 80 years old. It measures 8 feet in circumference, including the rough bark, at 6 feet from the ground; and the main trunk of the tree, before it divides into two branches, contains about 30 feet of timber. The two branches we estimate at about 28 feet of timber.

The following account will show the increase of the tree since the year 1799, taken every fifth year, the circumference being always taken at four feet from the ground, where the hand naturally holds the strap.

1799,	Circumference	5ft.	11 in.
1804,	.....	6	3
1809,	.....	6	8
1814,	.....	7	1
1819,	omitted.		
1824,	.....	7	9
1829,	.....	8	3

The adjoining Acacia.

1799,	Circumference	5ft.	2 in.
1809,	.....	5	8
1814,	.....	6	0
1824,	.....	6	9
1829,	.....	7	3

It appears that, when acacias attain this size, they encrease very slowly. I made the experiment of planting acacias in new-made hedge-rows, thirty or thirty-five years ago.

They encreased much the first six or seven years, but I do not think they will ever become large timber. I copy from my book the encrease of a cedar of Lebanon, planted in 1780, the fastest growing tree I have ever seen, except, perhaps, some of the poplar tribe.

Cedar.

1799,	Circumference at 4 feet,	2ft.	7 in.
1804,	.....	4	0
1809,	.....	5	2
1814,	.....	6	3 $\frac{1}{2}$
1819,	.....	7	4
1824,	.....	8	6
1829,	.....	9	10

It is now more than 10 feet, and contains a great quantity of timber, including all its numerous branches.

A smaller Cedar, planted in 1799.

1804,	Circumference at 4 feet,	0ft.	8 in.
1809,	.....	1	9
1814,	.....	3	1
1819,	.....	4	4
1824,	.....	5	8
1829,	.....	6	11

I have many other cedars planted in 1799, which grow equally fast, showing that my soil is very favorable to them.

A young oak, whose contents were $5\frac{1}{2}$ feet cubic in 1799, value 10s., measured 36 feet in 1826.

If at any time you should wish for further particulars, I shall be happy to afford any information in my power.

Signed,

KING.

No. XXXII.

From MR. WILLIAM PAUL.

Dear sir,

I HAVE sent you the dimensions and other particulars respecting the locust trees, growing at Ashwood Lodge. The young trees, of which there are seven, were planted about thirteen years ago, by J. LLOYD, Esq., in a small plantation near his mansion-house at Pentney. I have sent you particulars of three of them. The remaining four are rather smaller than the smallest tree, of which I have sent you an account. They were planted with fir, chestnut, and fruit-trees. The measurement of the two largest I have also sent, the one a spruce and the other a

larch fir, that you may see the difference in favour of the locust trees ; and also of one of the old trees, which was planted about forty years since. MR. LLOYD cut down, about ten years ago, two others, which were planted at the same time, but much larger and handsomer trees. There are several more growing about the garden and shrubbery, but the age of them is not known.

No. 1.

Girth at bottom, $6\frac{1}{2}$ in. circumf. 26 in.

At 3 feet high, 5 $20\frac{1}{2}$

At 6 feet high, $4\frac{1}{2}$ 18

At 12 feet high, $4\frac{1}{2}$ 17

Height, 30 feet.

No. 2.

Girth at bottom, $7\frac{1}{2}$ in. circumf. $30\frac{1}{2}$ in.

At 3 feet high, $6\frac{1}{4}$ $24\frac{1}{2}$

At 6 feet high, 5 20

At 12 feet high, $4\frac{1}{2}$ 18

At 18 feet high, $3\frac{1}{4}$ $13\frac{1}{4}$

Height, 32 feet.

No. 3.

Girth at bottom, $6\frac{1}{4}$ in. circumf. $25\frac{1}{2}$ in.

At 3 feet high, $5\frac{3}{4}$ $20\frac{1}{2}$

At 6 feet high, $4\frac{1}{4}$ 17

At 12 feet high, 3 12

At 15 feet high, $2\frac{3}{4}$ $11\frac{1}{2}$

Height, $28\frac{1}{2}$ feet.

Aged tree.

Body, $5\frac{1}{2}$ feet high, ..	girth, 16 in.
First arm, 7 feet long, ..	10
Ditto, 9 feet long, ...	6
Second arm, 12 feet long, ..	8

Best Spruce Fir.

Girth at bottom, 7 in. circumf.	28 in.
At 3 feet high, $5\frac{1}{4}$	$21\frac{1}{2}$
At 6 feet high, 5	$19\frac{1}{2}$
At 12 feet high, 4	16

Height, 31 feet.

Best Larch Fir.

Girth at bottom, $6\frac{1}{4}$ in. circumf.	$25\frac{1}{2}$ in.
At 3 feet high, $5\frac{1}{4}$	21
At 6 feet high, $3\frac{3}{4}$	15
At 12 feet high, $3\frac{1}{2}$	14

Height, 25 feet.

Signed,

WM. PAUL.

Ashwood Lodge, Pentney, Norfolk,
April 16, 1832.

No. XXXIII.

Communicated by his Grace the DUKE of RICHMOND.

Sir,

I BEG to forward you an account of some of the acacias, in the garden and park of Goodwood.

Signed,

RICHMOND.

Goodwood, Dec. 30, 1832.

Measure of Acacias in the Park.

	Girth at 1 ft. up.	At 6 feet.	At 12 feet.	At 18 feet.	At 24 feet.	At 30 feet.	
No.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	
1	6 6	5 10	4 2	3 0	2 7	2 2	60 feet high.
2	4 6	4 5	4 4	4 0	3 3	2 8	50 feet.
3	5 6	4 4	4 3	3 7	2 0	....	56 feet.
4	4 4	3 8	3 6	3 0	....	....	45 feet.
5	5 8	4 9	3 8	3 6	....	....	40 feet.
6	6 7	6 4	3 8	3 6	....	....	45 feet.
7	6 3	4 4	3 6	2 9	2 1	....	55 feet.
8	5 4	4 4	4 0	3 4	3 0	....	35 feet.
9	6 3	5 5	5 3	4 3	4 0	2 8	55 feet.
10	4 6	3 10	3 4	3 0	2 2	....	50 feet.

Measure of Acacias in the High Wood.

	Girth at 1 foot up.	At 6 feet.	At 12 feet.	At 18 feet.	
	ft. in.	ft. in.	ft. in.	ft. in.	
No. 1	5 8	5 0	4 6	3 3	About 45 feet high.
2	5 8	4 4	3 2	2 1	About 45 feet.
3	7 2	6 0	4 5	3 6	About 40 feet.
4	10 4	9 5	7 0	5 8	About 35 feet.

No. XXXIV.

From MR. J. RUSBRIDGE, of Goodwood, referring to the Trees mentioned in No. 33.

Sir,

THE acacia trees growing at this place are on a gravelly soil, the subsoil being strong red loam. I have known much of this timber used for outdoor fences, which is now standing, after thirty years' use, perfectly sound. I consider the timber of great durability, and much superior to oak for its strength and duration.

Signed,

J. RUSBRIDGE.

No. XXXV.

Important Communication from EARL STANHOPE.

Sir,

I HAVE received your letter of the 4th instant, and am happy to subscribe to your intended publication on the acacia tree. I have reared great numbers from seed, which is procured in Germany for about ten pence or a shilling per lb. ; and I have found, that the soil and situation in which it is planted are of considerable importance. In a wet, cold, stiff, or clayey soil, it dies, or grows very slowly, becomes stunted, and acquires a very different appearance and character from that which is natural to it. In a situation which is exposed to the wind, its branches are often broken, and it is only fit for underwood. I tried, but quite without success, to form hedges of it ; and experience showed it was unfit for the purpose. It seems to me, that it would not be suited for hop-poles, as was represented, its shoots being generally lateral, and not a continuation of the leader. I believe it to be a very durable wood, and to have the important quality of resisting moisture, on which account it is, as I am informed, used in Germany for stakes for vines.

A clergyman in this neighbourhood informs

me, that a waggon had been constructed for him of this wood, and that it was found to be lighter and stronger than any other. I had intended to make some experiments on the comparative strengths of this and of other woods, such as oak, ash, elm, beech, and fir, by ascertaining what weights would be required to break flat pieces of them, of about the width and thickness of a ruler. HARTIG, in his invaluable German work, his *Manual for Foresters*, in 3 vol. 8vo, states, that the wood is heavy, and that a cubic foot weighs, when quite fresh, 60lbs., and when quite dry, $43\frac{3}{4}$ lbs. He states also, that, in warm situations, and in a good soil, it has made shoots of 10 or 12 feet in length.

I have planted very extensively, and at a very moderate expense; and the plan which I adopted is, with some modifications which experience taught me, that which I should strongly recommend.

Signed,

STANHOPE.

Chevening, May 8, 1833.

*From HARTIG'S Manual for Foresters, 3 vol.—
Vienna, 1823.*

Volume 1, page 120. “ In a situation where it is surrounded by other trees, it forms a straight stem ; but, in an open situation, it is much inclined to have a short stem, and to throw out, not only many branches, but also many roots.”

Page 121. “ The seed is sown in the spring in good garden-mould, and in a sunny situation, and is covered with earth a quarter of an inch deep. The plants appear, after three or four weeks, with round leaves, and make considerable shoots even in the first summer, when the soil is very good, and the plants are kept clear of slugs and weeds.

“ The acacia requires a mild or at least a temperate climate ; and a light soil, mixed with much vegetable mould, in order to grow well. It does not bear a severe climate, and a very stiff or moist soil. It must also have a sheltered situation ; otherwise, the wind breaks off the boughs, and often splits the stem even down to the roots. If it is intended to become a large tree, a place must be chosen for it, which is sheltered from the winds, and must always be closely surrounded. This sort of wood is best fitted for underwood ; for after the stem is cut

off, there is an incredible number of shoots from the roots, and they grow with wonderful rapidity."

Page 122. "The wood of the acacia is firm, heavy, lasting, and extremely handsome. It has a yellowish colour, and a lustre like silk, when it is properly worked. It is also very good for burning, but not so good as some represent who have not made trials."

No. XXXVI.

Letter from DR. BOWRING.

My dear sir,

I FOUND the application of the acacia to the purposes of ship-building, under the consideration of the authorities of this great port. A series of experiments was instituted two days ago, of which you will find the results at foot. I saw the specimens both of oak and acacia. The oak was chosen of the best quality—the acacia (the common locust) from New York. I do not know whether our government is alive to the subject, but I confess I have been much struck with the teachings of these experiments. I received your letter on the 9th, and am now on my way back to Paris; and shall, on all occa-

sions, be most happy to be made useful to you.

Signed,

JOHN BOWRING.

*Consulat Britannique,
Brest, 13th May, 1833.*

The experiments were made on pieces of oak and acacia, 30 millemetres square and 46 centimetres long.

Their weight was,

Acacia, No. 1, 350 grammes.

2, 350

3, 360

Average, $353\frac{1}{3}$.

Oak, No. 4, 300 grammes.

5, 290

6, 298

Average, 296.

Their strength, exposing 41 millemetres between the points of pressure,

No. 1, 1460 kilogrammes.

2, 1360

3, 1460

Average, 1427.

No. 4, 800 kilogrammes.

5, 780

6, 880

Average, 820.

Their flexion, at the moment of rupture, was

No. 1, 30 millemetres.

2, 28

3, 26

Average, 28.

No. 4, 25 millemetres.

5, 19

6, 20

Average, $21\frac{1}{3}$.

Under the weight of 800 kilogrammes, which broke the oak, the flexion of the acacia was,

No. 1, 9 millemetres.

2, $8\frac{1}{2}$

3, 9

Hence the weight of acacia is one sixth greater.

The strength of acacia to oak is as 1427 to 820—the elasticity is as 21 to 9.

No. XXXVII.

From ARCHDALE PALMER, Esq.

Cheam, December 11, 1833.

Dear sir,

I SHOULD have been happy to hear what experience you have since had of the value of the acacia, upon which we, at our last meeting, compared notes : however, in the absence of that information from you in your letter of the 6th instant, I feel considerable satisfaction in giving you the result of my further experience.

You may perhaps recollect, that I erected a fence with oak posts, and another with acacia posts, about fifteen years since. Two or three years ago, every oak post required spurs, which were applied ; whilst the acacia continues, even at this time, as sound as ever : there were about forty of each.

I confess that last year, upon examining the acacia posts, I found that I had been too sanguine in my estimate of them, as several appeared to be decaying : and, in consequence, I had the ground around them removed for examination, when I had the pleasure to find, that the sap and bark only had decayed, which workmen in general, very foolishly, do not give themselves the trouble to cut off : but the heart

was sound, and I had occasion for nothing more than to remove the rotten parts, and ram the earth about the posts, which seem likely to remain as sound as my most sanguine hopes would have led me to expect.

I have an acacia post now on my premises, sound also, which has stood thirty years.

The trees I planted fourteen years ago are still thriving, and many of them large enough for field gate-posts.

We know that, for that purpose, an oak should be above double that age to be equally useful, in even favoured situations for the growth. I do not however find, that acacias will thrive on clay land, where oak trees must still be preferred.

I sent a few acacias to a friend in the Isle of Candy, near Southend in Essex, where they thrive prodigiously : the soil is sandy loam.

You are welcome to make use of any part of this information, the subject of which, I feel with you, should attract the notice of all land-proprietors, who are not only alive to their own interest, but seek the permanent advantage of the country.

Signed,

ARCHDALE PALMER.

No. XXXVIII.

The following Communication from MR. JAMES MAIN, Landscape-Gardener and Rural Improver, Chelsea, will be read with the interest it merits, by all those who are acquainted with the ability of the writer.

Dear Sir,

I HAVE cultivated the acacia for many years, and can corroborate all that has been said in praise of the excellence of its timber, by English, French, and American writers. To millwrights, for the cogs of wheels, the acacia stands unrivalled; and for all descriptions of machinery no other wood wears so well, or is more durable. Its beauty as an ornamental tree is universally admitted, more especially when arrived at its mature form. It is truly a painter's tree—the light elegance of its foliage, pendant position of its flowers, and the varied ramifications of its spray, attract the notice and command the admiration of every one. The only drawback on its value is, its liability to be shattered by wind. This proceeds not only from the brittleness of its young shoots, but from their rampant lateral position. On this defect some pertinent advice will be expected of you, and on this point I may afford you a useful hint, afforded by my own practice; viz. fore-

shortening the *side-shoots* during June and July, by pinching off their extremities. This management, while it gives supremacy to the leader, prevents the rambling extension of the branches, rendering them stiffer, and less likely to be torn off. The acacia very often produces two or three shoots, of equal size, from the top of the leader : these struggle for the mastery, and during the contest one or all are snapped off. In this case, one should be preferred by stopping the others, by which means the symmetry of the tree is preserved, and its aspiring tendency encouraged.

On its favourite soil, a gravelly loam, the tree gains an altitude of about fifty feet, and a diameter of about fourteen inches, in the space of forty years. In sheltered situations, the growth is more rapid. Those that I have noted stood on exposed lawns, and were handsome, well balanced trees. They are not liable to be shattered after they are fifteen feet high, nor after they are eight or ten years old ; but if you plant and cultivate them, as you have advised the oak to be, you will find fore-shortening, and cutting away suckers or strong shoots from the lower part of the stem, very frequently necessary.

Do pray drop the barbarous name, locust. There are several American trees known there

by that name, but it puzzles even an English botanist.

Signed,

JAMES MAIN.

January 6, 1834.

No. XXXIX.

*From MR. BENJAMIN COUCH, late Timber and
Store Receiver of Plymouth Dock-Yard.*

Dear sir,

I RECEIVED yours of the 7th ultimo: and in reply observe, that, in making my collection of timber, a locust tree-nail was almost the first specimen presented to me. I recollect that, about thirty years since, certain ship-owners in Scotland, considering that locust tree-nails were very durable, with great lateral strength, were in the habit of sending to the United States for a supply. I have reason to think that, in consequence of my mentioning this circumstance to a gentleman high in office, they have been contracted for and employed in the dock-yards, where they have attained a very high character. I speak of locust of *the growth of the United*

States. I have had no experience, neither have I obtained any information, respecting the qualities of locust, the growth of England. I take it for granted you have read EVELYN's *Sylva*: I would refer you to the third edition, 1801; and in the very rich notes, by A. HUNTER, M.D. F.R.S. L. and E., in vol. 2, p. 66 to 71, you will find a very interesting account of the false acacia or robinia.

Signed,

BENJAMIN COUCH.

*Summerland Place, Plymouth,
January, 8, 1834.*

No. XL.

Maidenhead Thicket, July 10, 1834.

My dear sir,

You cannot doubt that the honour conferred, by confiding to me the translation of the French works upon the acacia, and of superintending the arrangement of other important parts of your forthcoming publication, must have excited in me a lively interest in all that refers to the propagation and culture of that beautiful

tree. I therefore feel called upon, to add my testimonial to those which have preceded ; and I trust, that the following account of experiments which I myself have conducted, in the very spot that I now possess, will not be found out of place in a work, which, I hope, may be influential to induce the nobility, gentry, and other extensive land-proprietors of our country, to devote their utmost attention to extend the culture of a tree, which, to say the least of it, is one of the most ornamental, and promises to be one of the most useful, that can be introduced into garden and rural scenery.

In the arrangement of the annexed details, I propose to consider, *first*, the nature of the ground ; *second*, the processes of preparing and sowing the seeds ; *third*, the culture of the seedlings : and *fourth*, the transplantation of the trees.

Of the Soil, and its Preparation.

In the year 1831, I set apart a small plot of ground, wherein to raise, and nurse for a year or two, a few plants of the robinia pseud-acacia, which title is now ascertained to refer to the tree, known by the term of locust, false-acacia, white acacia, and so forth.

If in the first instance, you clearly understand the object I had in view, you will be able

to arrive at a correct conclusion of the success which has attended the experiment. It was not my aim nor intention to produce large trees ; but to possess myself of about one hundred, which might serve the double purpose of adorning several parts of the property, and of yielding, from time to time, a supply of durable stakes, and smaller props, for the use of the kitchen and flower gardens.

The soil of this district has the appearance of, and indeed is usually considered to be, a rich and mellow loam. Its color is a light hazel, varying to red or brown in the lower strata. By minute analysis, however, I find it to be, strictly, *an extremely sandy loam*, containing above ninety per cent. of coarse or fine siliceous sand, and pretty equal proportions of the more minutely divided components of soils ; viz. alumine, chalk, and oxide of iron—the latter in a state of high oxygenation. These constitute the remaining ten parts of the hundred ; for there is scarcely a trace of any decomposable matter, unless such be found in the few fibres that exist in the turfy surface. This large proportion of sand does not produce friability of texture ; for the soil is adhesive, and when dried by a hot summer-sun, it is made up of harsh, unyielding clods. There is a natural cement in such soils, wherever they are found, which binds the constituents closely together ; and persons who do not investigate them chemically, are apt to con-

clude that they require sand to render them open and porous : hence they make frequent additions of that material, which, if it be of a harsh, gravelly nature, will tend to impoverish the staple, and increase the evil. A fine *calcareous* road-sand, such as is met with in the limestone districts, will often, indeed, prove an excellent meliorating medium, not only as it contains in itself abundance of carbonate of lime, and other important earths, but because it is blended with vegetable and animal manure. When a soil superabounds with ochreous, flinty sand, manure, freely applied, is, perhaps, the only substance which will effectually meliorate it ; for it alone adds *decomposable* matters, that by *natural chemical agency*, are *gradually converted* into *highly nutritive*, or at least *salubrious*, staple earths.

The soil of my garden is naturally of the harsh, ungenial quality that I have described ; but it has depth, and rests upon a stratum of marly chalk, above pure chalk. The spot selected for my seed-bed had been a shrubbery, wherein several large yew-trees grew. Hence, in grubbing up the roots of these and other trees, we had to labor the land to a considerable depth, and to exchange, in a degree, the surfaces. Much vegetable matter was also accumulated by means of the foliage, and the masses of fibrous roots, and this was incorporated with the earth. I had then a tolerably rich bed of

well prepared earth for the foundation of my projected plantation.

Preparation and Sowing of the Seeds.

In consequence of the mention made by MR. COBBETT, in his *Woodlands*, of the utility of immersing the seeds of *robinia pseud-acacia*, and also of *gleditschia triacanthos* (or three-thorned acacia), I resolved to institute a variety of experiments upon both. I therefore divided a paper of seeds of the former into three parcels: upon one of these I poured water, heated to about 160 degrees—another was soaked in water, heated to 140 degrees. The third parcel was simply sowed, in a rather large pot of rich, light earth, without any previous preparation whatever. The seeds of the two former parcels were kept in the fluid for several hours, the water cooling gradually to the temperature of the room. They were then sown, one or two inches apart, seed from seed, in two distinct drills, sixteen inches asunder at the least.

The pot was placed in a melon-pit, that was heated by an internal bed of leaves only; but in which the temperature was never below 60 degrees, and occasionally very high. The seeds in the bed began to appear in a few weeks. The plants rose in due time, and pretty regularly; but some lingered, and I believe did not sprout till the spring of 1832.

Those in the pot were greatly assisted : the plants were up in a few days, and their seed-leaves (which are roundish, and very different from the true leaves of the tree), quickly covered the whole surface. I believe I had sixty young plants, an inch or two high, in less than a month ; and the pot was not kept long in the pit, but was taken into a cool room, that they might be hardened by degrees.

I ought to have stated, that the experiment was begun on the sixteenth of April, 1831 ; but there are several particulars which I cannot precisely mention. I regret now, that I did not take notes of every operation ; but at the time I had no idea, that I should, three years subsequently, be called upon to enter into a detail of what I then performed. As circumstances have turned out, I am constrained to refer to very imperfect memoranda, and frequently to rely solely upon the mere recollection of facts.

I now shall slightly notice the trials I made with the seeds of *gleditschia*, in order to show what may or may not be a prudent method of proceeding, when an attempt is made to accelerate the germination of foreign seeds. .

Those of this fine shrub are kidney shaped, and much larger than the seeds of the *robinia* : both are covered with a strong and hard *testa*,

or integument. One of the short notes in my diary states, that I divided a paper of seeds of *gleditschia* into parcels of fifty each. One set was immersed, in cold water only, for about twenty-four hours; a second in water heated to 140; others in hotter water; and to one, water at 212 degrees was applied, and the seeds were actually boiled for a few minutes. I also soaked a few seeds in a weak but cold solution of chloride of lime. The several parcels were sown separately, with very varying results. I did not obtain a single plant from those that were boiled, or treated with the chemical solution: in them, the vital principle was entirely extinguished. A few plants only were raised from the seeds immersed in cold water, and that at 140 degrees: more from others to which water at 170 was applied. The experiments were made May 28, and the results were noted on June 10 following; so that I proved, by a comparison with another parcel that had been sown a month before, *with little preparation, that immersion in hot water accelerates germination, but tends to destroy or injure the seeds.*

Culture of the Seedlings.

The young plants of robinia, raised in the two drills, progressed very well; they were kept clean by the hoe, and many attained the height of five or six feet by the end of October. The seedlings in the pot were turned

out with the entire ball of soil and interlaced roots, into a bed of light vegetable-earth and sand, almost as soon as the real leaves became apparent, and not one seemed to fail. When they resumed their growth, I opened the earth to a little distance around them, insinuated a smooth pointed stick among the roots, and cautiously pushed the plants somewhat apart, filling up the spaces with the light earth : this gave some room. The operation checked the growth for a short time, but the greater part did well ; and, as far as I recollect, the plants were removed into a nursery-row before the fall of the leaf. I have frequently found that young trees, while in a tender herbaceous state, may be moved with almost as much safety as a true herbaceous, perennial seedling, provided they be regularly and prudently watered (not swamped), and screened from the scorching sun ; but if once the *woody* character be fairly established, they must be retained in their seed-bed till the period of the fall of the leaf. The vascular system is more simple in the former state : in the latter, when the fibrous longitudinal processes are formed, and the lateral, convergent processes developed, the conduits of the raw and prepared saps are more numerous, and their offices more complicated. Hence, a check must be attended with corresponding danger.

Transplantation.

A strip of ground, within eighteen inches of

the edge of a dry ditch and two thirds of its length, on the north east end of an orchard, was prepared, by removing the turf, deeply digging the soil, and laying the turves, inverted, at the bottom of the open trench. Upon these the soil was returned, but so that the surface stratum was put at the bottom, and the lower stratum brought to the top: it was of a harsh, ochreous, and binding quality; and so far unfit for the propitious culture of the tree. I mention this now, though I did not remark it at the time, in order to afford a means of comparison with another mode hereafter described. In this reversed soil, a row of fine acacias was planted, two feet asunder: the date of this operation was December 14, 1831.

Every injured or broken root was cautiously pruned, and the trees were placed as near to the surface of the ground, as was consistent with steadiness of position. Other fine plants were raised, and planted in different spots of the shrubberies; and the remainder, of small size, were ranged in two regular lines in the seed-plot, to gain strength by another year's growth.

1832. A large piece of ground, in the same orchard, was trenched eighteen inches deep. The turves were buried, and the soil returned; but so as to retain the upper spit of earth at the surface. This piece was connected with the

strip above described, and formed a broad plot; and it ran along the edge of the same ditch: I therefore now (December 13, and one year, less one day, after the former process) completed the row of trees, by bringing from the nursery-bed all the spare large plants; but these, having fine bushy heads, were placed one yard apart. Not a twig nor a root was touched, unless to remove some injured part. The roots were placed near the surface; and some heavy inverted turves were laid over the soil, close around the stems, to afford a slight *pressure*, and to protect the roots from the winter's frost. I never saw any evil from this species of *natural mulch*: the weight of the thick turves keeps down the roots, their inverted position prevents the free growth of their grass, and the gradual decay of the vegetable matter affords a top-dressing of salubrious manure. During the silent season of frost, protection from its rigour is afforded; and when the advancing season presents the stimuli of light and heat, the removal of these inverted turves gently opens the soil, and sufficiently laborates it for the first time. The operation secures a mild and sufficient top-dressing.

1833. The winter had passed by, and the trees remained in sound health, and in their proper position. Just previous to the commencement of vegetation, *I cut down*, nearly to the surface, *every alternate tree* of those removed

in 1831, in order to draw a fair comparison between the future growth of amputated and unamputated acacias, growing upon the same spot of ground. The trees of the second transplantation remained untouched. Of those planted in shrubberies, I cut some, and left others entire. Almost all the amputated stocks sent up two or three shoots, some were strong, others very weak. Of these the strongest was selected, when the substance had acquired sufficient hardness to promise security from the effect of the wind; and all the others were cut away. I possess not the date of this regulation.

Hitherto I am by no means satisfied with the results of heading down. Two of the trees never rallied. The shoots of some are not so strong as those of others that remained uncut; but then, the sandy and binding nature of the soil, about the first set, has not been favourable to the extension of new radical channels of nutriment. The plants of the second set (December 13, 1832) made very steady progress: not one remained torpid. All started off, and protruded roots into the fine, black, top-spit soil of the last trenched land, and so also did those in the shrubberies; but even there, I think, the uncut trees show more strength, and far finer heads.

July, 1834. The tallest trees are now between nine and ten feet high. These are found

in the gardens, and in the last planted line of the orchard : not one of the first line, in that raw unmellowed soil, brought from beneath, could, last year, compete with the trees in the black, wrought ground of other spots ; nor, till I fill that hard soil with vegetable matter from green growing crops, by turfing, or by manure, and break it up by repeated hoeings, &c., can I expect to see the trees advance into rapid progress.

Experimentally then, I assert, with others who have proved and written before me, that, although the acacia will live and grow in heavy and inferior land, it will be in more sturdy health, and advance with more rapid strides, in rich, light, and well-meliorated soils.

Incidental Observations.

Some of my trees have fine straight stems, but by far the greater number are short, with very beautiful, branchy, and well-balanced heads. I have not aimed at length and clearness of stem, generally ; but I am now commencing the work of pruning off lower branches and fore-shortening others above, in order to obtain stakes and poles from five to seven feet long. They who would have trees with a clear, unbranched trunk of from ten to twenty feet, must destroy the competition that naturally exists between the upper branches of this tree. It

is exceedingly inclined to ramify, even at two and three feet from the ground ; and unless the predominance be given to one branch (the most direct) by pruning off small laterals, and fore-shortening others, as recommended by MR. MAIN, in his letter, No. 38, no one can rationally expect to realise his intention.

With respect to soil, I must repeat, and impress the fact too, that rich garden-soil, regularly manured, secures the most rapid developments. One of my first removed trees was planted at the angle of a garden-bed, near a walk : it started off at once into vigorous growth ; and in the summer of 1832, attained to so large a size, that I was constrained to remove it again, and it is now nearly ten feet high.

Another year will be required to determine, whether *heading down* will promote or retard the growth, and *permanent* welfare of the tree. I am satisfied that it will produce a number of shoots ; but I confess that, as far as my experiment has extended, I doubt whether, if practised on plants so young as mine were, it can be productive of real benefit.

Hitherto my trees have sustained no injury from storms of wind, and still we have had a great prevalence of windy weather ; and the trees have large, bushy heads. I cannot, therefore, join in the general complaint.

Cattle are said to be exceedingly fond of the leaves and sprays of the acacia, and my experience justifies the assertion. The only trees that have received injury, with me, are one or two in an external shrubbery, which were within the reach of a cow, that once or twice broke pasture, and strayed into the adjoining yard. In a few minutes it became sufficiently visible, that the animal relished the verdant aliment, for not a leaf or twig would have remained, had not the accidental circumstance been discovered in due time : as it was, the tree was effectually fore-shortened. We have of late given the green spray and leaves of removed branches as food ; and, with the exception of Indian corn (*zea*), nothing else appears to be eaten with a higher degree of relish.

I shall not enlarge these observations : I hope, my dear sir, that I have afforded evidence that the tree can be grown in England, with great facility ; I have also, I believe, made it evident, that a due preparation of the soil, and a prudent application of manure, are indispensably required to procure rapidity of growth. As far as my experience has yielded evidence, I am satisfied that your method of preparing and planting are guarantees of success ; and I see reason to conclude, that my best trees are to be found, where the most efficient tillage has been employed. One fact, however, I must add : it is, that I differ from

those who think that very young trees only are injured by wind. I have said, that my seed-raised plants have not suffered, and the assertion is correct ; but when I first came here, I found a tall straggling acacia, perhaps nearly fifty feet high, which had lost a great limb by the wind. A storm, about two years ago, added to the injury ; and I had the stem reduced to less than one half its height, at a point whence a fine secondary young branch emerged. This branch has now developed a bushy head ; the hole, where the amputation took place, is covered with spray ; new shoots were protruded during the growing season of 1833 ; and these, daily at this period, receive extent and fresh additions : the tree is a perfect picture.

I trust the time is not far distant when I may welcome you here ; and, in the enjoyment of your society, have ample opportunity to inspect my acacias, and to compare them with others, of which we have a fair sprinkling in the neighbourhood.

I have the honor and pleasure, my dear sir, to subscribe myself,

Your faithful friend and servant,

*The Author of the Domestic
Gardener's Manual.*

No. XLI.

*Extract of a Letter from SIR THOMAS BEEVOR,
Bart., dated March 13, 1834.*

As regards the quality of the timber of the locust, I believe it to be, for such purposes as its size and mode of growth render it applicable, superior to any we have. It excels all our other timber in strength and durability. I am speaking, not of American grown locust, the virtues of which I presume no one pretends to dispute, but of such as is of our own growth; and I will now give you an instance or two in proof of my assertion.

Two or three years after my father's death, I found amongst a lot of wood, which had lain abroad so long as to be unfit even for the fire without some preparation, and which consequently I had suffered to continue to lie till I wanted to clear the spot for some other purpose, the top-end of a locust tree, which must have been lying there nine or ten years, as no tree of the kind had been taken down within that time. The bark was gone: the sap-wood, whether from the effect of the weather upon its own juices, or from the decaying oak and other woods around it, was of a pale dull brown colour, very similar to that of walnut-tree wood

which has been long exposed to the sun ; but the heart was as bright and as fine as on the day when it was felled. Soon after, having occasion for some posts for a cattle-shed, I used a piece of that wood, together with the top-end of a Spanish chestnut tree and some pieces of oak, for that purpose. This was about ten years since. I had not seen them for some years : indeed, the experiment had almost passed out of my mind. Since I received your letter, I went over for the purpose of examining them. I found the oak and chestnut posts, as might be expected, a little decayed on the outside near the ground, from the effect of the dung, but the locust was unchanged. Here is proof enough, that the locust does not lose its characteristic durability by being grown in this country.

I have also used the wood for stakes, to mark the situation of bulbs and other flower-roots. Some which I put out a dozen years since are standing and sound, whilst oak stakes of the same kind are continually rotting off at the surface, and require constant renewing.

Hargham.

No. XLII.

Communicated by DR. DAUBENY, *Professor of Botany, Oxford.*

THE upright trunk of the common acacia tree, *robinia pseudo acacia*, in front of MISS WILLIAMS'S house, at the bottom of the High Street, is 10 feet high from the ground to the first branches; and the girth, at about 6 feet from the ground, is 4 feet 5 inches. The tree is so closely connected with a wall, that it cannot be girted lower down. It contains about $11\frac{1}{2}$ cubic feet of timber. The main branch, which hangs over Rose-Lane, is the only one fit for timber: this is $4\frac{1}{2}$ feet $1\frac{1}{2}$ inch in girth, and contains about $8\frac{1}{2}$ cubic feet of timber. Total contents, 20 feet.*

Oxford, July 9, 1834.

* There is nothing remarkable in the growth or appearance of this tree; but I was induced to apply for the particulars of it, in consequence of being present when it was planted, about thirty years ago.—*Editor.*

No. XLIII.

From MR. CHARLES POPPY.

Dear sir,

IN answer to yours of the 13th, I am sorry to say, that my experience in the growth and use of the acacia is very limited. My attention was drawn to the subject, from seeing the post which was imported from America by MR. COBBETT, which, it was stated, had stood exposed to the weather eighty years; and which, I was led to conclude, might be a fact, from being shown a piece of acacia, that was sawn off a post on the DUKE of NORFOLK's estate at Fornham, which had stood in the ground fifty years, and was as sound as when first put down. These are the only facts I know of in respect to the durability of the timber of mature age.

About twenty years since, I planted a few acacia trees as ornamental shrubs: some were crowded and stunted, but are now handsome trees. One, standing by itself, is now I believe thirty feet or more high, and thirty inches in circumference; whilst numbers of young oaks of the same age, and others still older, are not near that girth: and taking the sap into account (to which the acacia is not subject), they are but half the girth. But, in fact, the more

rapid growth of the acacia is but a secondary recommendation : its greatest value is from its thriving on poor soils, producing timber equally good from the stub or stool after being felled, as of the first growth ; and from the nature of the wood, fitting it for various purposes *without waiting for mature age*.

It may be cut for stakes, hurdle-heads, stile-posts, posts for batten-fences, water-bars, and gate-posts, as it comes to the requisite size for these and various other purposes, *without quartering or sawing* ; and thus saving a great expense. I confine my observations to its use for farm-purposes, on which head you have but slightly touched in your prospectus ; but I admit that it is excellent for others. The acacia being far more durable than other wood, when exposed to the weather in *its young state*, renders it peculiarly useful for the following purposes : viz., in a garden, as stakes for espaliers, &c. : and in orchards, pleasure-grounds, parks, or other pasture or feeding grounds, as posts, to support a frame-work, for protecting single trees, till out of the reach of cattle. Oak is too expensive and scarce for general use for that purpose, and other wood rots at the ground ; and cattle break down the fabric, and break or bruise the trees. Thousands of ornamental forest and fruit trees are thus destroyed annually, to the injury of the owners, the occupiers, and posterity ; and people are deterred from planting, from the want of a

cheap and durable wood to protect the trees : and thus there is a great deficiency of fruit over a great portion of the country. I have not attended much to its cultivation, but I find it takes root readily ; that transplanting or cutting down does not injure the wood, and that it is easily raised from seed ; and, when once a tree arrives at maturity, that there will be no want of a supply of young plants, as numbers rise, either from seed or from the roots, enough to plant every useless nook and corner, and to supply a farm, or an estate, with wood for all such various purposes as are required on a farm for ever.

I agree with you as to the utility of tillage and manure being amply applied, and I agree with you in respect to such giving employment to the labouring class in the first instance ; but planting on a broad scale reduces labour *in the end*, as it takes so much out of tillage, except as to waste poor land, where the trimming and felling may give more employment than whilst in its unimproved state. But this is not the main question : remuneration for capital employed is the leading star, and planting will amply repay any outlay ; and in respect to the acacia, with a quick return, and in an annual increasing ratio. There is no competition between the acacia and any other wood that I am aware of, but oak, in respect to the question at issue ; viz., its durability when exposed to the

weather, and contact with the soil. I believe that acacia of twenty years growth will answer the purpose as well as oak of fifty years growth ; but I speak more from report, than from my own experience. As I am not aware of what proof of its imperishable nature you may bring forward, I refrain from further comment, except that, as acacia comes into use rapidly, there is a greater inducement to plant it : again, that oak timber is expensive to purchase, and to convert to profit, on account of the labour bestowed in separating the sap from the heart-wood. It is also to be preferred to other kinds of wood, as they require perpetual repair and replacing when in contact with damp. If it prove of such an imperishable nature as is reported, it must be invaluable for many purposes : viz., ground-cills, joists, and planks for barn-floors, and such like purposes ; for hop-poles as a means of preventing the hops from being blown down ; for posts, as being 100 per cent. cheaper than *oak* ; and (looking to the annual cost of repair) 500 per cent. cheaper than other wood.

Signed,

CHARLES POPPY.

Witnesham, Ipswich,
August 14, 1834.

No. XLIV.

From the REV. HENRY WALPOLE NEVILL.

Sir,

I AM very sorry not to have been able to send you the size of my acacia tree before this ; but I thought it best for the same person to take its dimensions as before, and he was not here when you requested it to be sent. The height of the tree* is 52 feet, round the body 11 feet 9 inches, the length of the body 4 feet, and the *spread* from one extreme bough to the other 52 feet. Some of the boughs *very* nearly touch the ground. I hope I have made this admeasurement clear to you.

Signed,

HENRY WALPOLE NEVILL.

Bergh Apton Rectory,
August 19, 1834.

* This is the tree referred to in Lord Nevill's Letter, p. 225.

No. XLV.

From MR. WILLIAM THOROLD, CIVIL ENGINEER,
NORWICH, *dated August 23, 1834.*

Sir,

IN answer to your enquiries as to my experience in the use of acacia-thorn, I can only say, that in my millwright's work I have found it extremely useful, for purposes where we had hitherto applied only the best *clear-grained* oak; viz., for pins and wedges, for setting fast the gudgeons of water-wheel shafts.

We have found wedges of this wood (the shafts being of British oak) to have the peculiar property of retaining their adhesion, even if the gudgeon should heat in a slight degree, which we never found to be the case with oak wedges. The shafts in the new mill at Hempstead have their gudgeons set fast with this wood (acacia), which, being near, you can examine. We use it also for levers, handspikes, and tool-handles.

I would venture to suggest, that it will make the best tree-nails for ship-builders: also halberd-shafts and other military implements.

I shall, in the next season, do some planting

on my estate at Attleburgh, when I shall adopt your method of trenching and manuring ; and, in selecting plants, you may rely that I shall substitute the acacia for Scotch and spruce firs, as the produce of former plantations of those species are now selling here to the bakers for fire-wood,

Signed,

W. THOROLD.

No. XLVI.

Communicated by MR. JAMES JOHNSON, *of Hockwold cum Wilton, Norfolk.*

Dear Sir,

I HEREBY send you a correct account of the acacia trees growing at the Rectory in this parish, late the REV. HENRY TILNEY's. I think they have not increased in size for the last five or six years. They were planted by a man now living in the parish about 45 years since. They appear to arrive at maturity in about 40 years. The soil is a good chalk and loam. There are seven of them. The three largest measure, 1st, 21 feet 4 inches ; 2nd, 20 feet 3 inches ; 3rd, 20 feet 3 inches—including the bark. There are two

beautiful trees of the gleditsia, one of them measures 8 feet 5 inches ; also a very large walnut tree, the body of which measures 133 inches, including the bark. There are several large elms also, which show, that the acacia trees will grow where any of the others will.

Signed,

JAMES JOHNSON.

February 3, 1835.

No. XLVII.

Haverhill, July 2, 1835.

Sir,

IN reply to yours of June the 15th, I have to observe, that MR. YARRINGTON must be mistaken about the acacia trees. I had one or two trees, but they have been taken down, I think, about twenty years. The wood was sound and very handsome, and I had the front of a wardrobe made of it. It would, I should suppose, be very ornamental and useful, but mine was not well done.

I have now a young plant, the top of which was broken off by the wind, and it last year

sent out four branches that measure 9 feet long. You are aware, that it is very brittle, and continually splintering with the wind.

I have this morning called on our clergyman, who has several acacia trees on his grounds ; and I have endeavoured to send you as good a description of them as I can. No. 1 is, I believe, as large as any in this country, at least I have never seen any so large. It is supposed to have been growing from about 70 to 100 years. Its outer branches are now nearly dead, and the tree itself is decaying. It will no doubt soon come down. I have taken its circumference at about 5 feet from the ground, where it divides into two large branches or trees. Indeed, the large trunk is split into two pieces, and partly hollow and decayed. No. 2 is an acacia which is now down by the wind. It appears to be quite sound, and I have no doubt but some very handsome furniture may be made of it.

I shall be happy to send you any further particulars that are in my power.

I am, Sir,

Your obedient servant,

HENRY W. JACKSON.

No. 1. A large acacia, now standing in the

pleasure-ground at the Manor-house, Haverhill. Its trunk, 5 feet from the ground, measures 13 feet circumference. It then becomes two branches or trees. The largest branch measures 8 feet in circumference, and is about 20 feet long until it branches out again, and the tree is about 40 feet high or more.

No. 2, now down, measures 17 feet to a branch, and is 6 feet in circumference at the bottom, and 4 feet 6 inches at the top.

ESSAY
ON THE
PLANTING AND MANAGEMENT
OF
TREES.

IN sketching out a few observations on the important subject of raising and managing forest-trees and shrubs, which may serve the purpose of a short compendium or vade-mecum for the guidance of the planter, the writer has thought it most expedient to arrange the information and advice he has to offer in the following order, which will tend to simplify reference, and carry on the sequence of instruction step by step, keeping pace with the growth of the trees.

1. On the situation of a nursery; and the several methods of raising, propagating, and transplanting forest-trees, and their necessary after-culture and management.

2. On the soils best adapted for the successful growth of the different British and exotic timber and ornamental trees, &c.; and the advantages of preparing and trenching the soil, draining it of superfluous moisture, and manuring and watering the seedlings, in the progress of their growth.

3. On lopping, pruning, felling, and the general management of copses, underwood, osier-holts, hedge-row timber, plantations, &c.

4. On the culture and management of hardy shrubs, evergreens, &c., for shrubberies, lawns, avenues, fences, &c.

5. On the diseases and casualties of trees, and the best known remedies for these.

6. On the produce of plantations, and the profit and advantages to be derived from an extensive growth of timber and trees, for shelter, fuel, ornament, building, &c.

7. Law with regard to trees and timber.

Every large estate, which is not contiguous to a public or commercial nursery-ground, requires a piece of land to be set apart as a seminary or seed-bed, for raising and bringing forward young plants, which, from having the advantages of congenial soils, watchful care in

subduing weeds and underlings, shelter, manure, &c., will hence strike out vigorous shoots ; and becoming strong and taper as they increase in growth, will of consequence make stately trees.

The situation selected for the nursery should be open and airy, but nevertheless sufficiently sheltered from those nipping north and west blasts, which would materially damage the tender foliage of the young trees. The surface-soil should be of an average quality, so as to be adapted to the majority of plants. It should be well trenched and mellowed, and if it lies exposed properly fenced in. Water should be occasionally applied. Separate beds must be set apart for the different species of plants, which will in many instances require different treatment. The young seedlings, when they appear above ground, should be kept free from weeds by the hoe, and earthed up to protect their roots from the sun, and to retain the moisture of the soil. Matting or litter may also be spread when the scorching heat would prove injurious to them.

Timber-trees are artificially raised, either from seed, by suckers, layers, or cuttings. Grafting and budding are chiefly had recourse to for propagating and improving fruit-trees, or for continuing those varieties of ornamental and timber-trees, which would lose their distinguishing characters if reared by other means. The best and most common mode of raising forest-

trees is from their seeds, keys, or nuts. Seeds should be gathered when mature, and sown on recently stirred soil, covered in to different depths, according to the size and texture of the seed, the nature of the soil and situation, and other local or influencing circumstances.

Some seeds, as those of the elm, lime, weeping birch, sallow, poplar, &c., require to be sown when ripe—others, as acorns, beech-mast, chestnuts, and ash-keys, may be kept till the following spring or longer, if moderately dried. The seed of the larch should be sown in April or May—acorns are to be planted early in February, in drills a foot apart, two inches deep. The best are obtained from Kent, the brightest and heaviest being considered the most valuable. The seed of the Scotch elm is ripe in June, and should be sown soon after: that of the beech is gathered in September, and sown in the following March or April, in drills one and a half inch deep. The seeds of the Spanish chestnut are best procured from Spain: they may be sown in February, in drills covered three or four inches deep with mould. Horse-chestnuts are to be sown in October. The seeds of the weeping birch and lime as soon as they are gathered.

The seeds of the mountain-ash, holly, white beam-tree (*Pyrus Aria*), yew, holly, &c., which hang long on the tree, will be found to be of

very slow growth ; while those of the elm, willow, and sycamore, which ripen and fall soon, vegetate rapidly and soon appear above ground.

As a general rule it may be stated, that heavy seeds, such as acorns, walnuts, chestnuts, &c., must be sown about two or three inches deep. Light seeds, on the contrary, as those of the smooth and mountain-ash, weeping birch, willow, and poplar, should be covered only about half an inch or less with fine mould. Ash-keys are gathered in December or January, and laid in heaps mixed with one third of their bulk of sand under cover : they should be turned over once or twice in the following year ; and thus, after resting for twelve or fourteen months, they are ready for sowing in March, in drills a foot from each other and one and a quarter inch deep. The seed of the plane, sycamore, maple, and ash, require to be covered about an inch with mould. The seeds of resinous trees, including the pine, fir, larch, spruce, cedar, &c., must be buried at various depths in a rather sandy soil, from half an inch to three inches. The cones of the Scotch pine, and some other species, open of themselves shortly after being gathered and spread in the sun ; but those of the pinaster (*Pinus Pinea*) and similar kinds do not, though treated in the same manner, open their scales for several months.

Suckers, slips, or side-shoots from the roots,

are separated from the parent-plant by being slipped down, or cut off, so as to carry with them a portion of fibrous roots; and they are afterwards planted in a suitable soil, &c. The best time for slipping suckers is in the spring. The kinds of trees usually reared by this mode are, the common small-leaved elm (*Ulmus campestris*), and several species of poplar, such as the abele-tree (*Populus alba*), the grey or common white poplar (*P. canescens*), and the aspen (*P. tremula*). The last three can also be increased by layers.

Grafting is principally resorted to for preserving those varieties of forest-trees which lose their specific or distinctive characters when raised from seed. The chief trees which require to be reared by grafting are several choice species and varieties of ash, beech, chestnut, poplar, and oak.

Layers are branches or shoots which are bent down from the stock and a portion of their length buried a few inches in the soil, that portion having been previously wounded by cutting, bruising, or twisting; and the descent of the sap, being thus checked, gives rise after a certain period to the production of roots. As soon as these roots are formed, the portion of the layer which has produced them is separated from the main-stock, or parent-stem, and planted by itself. The maple, alder, birch, plane-

tree, elm, hornbeam, abele, beech, ash, robinia, and lime-tree, are those usually increased by this method. Although layers may be struck at any season of the year, the best time for evergreens such as box, bay, holly, laurel, yew, &c., is about the latter end of August. Deciduous trees, as the oak, elm, lime, sycamore, &c., may be layered about the middle of October.

Cuttings are portions of the young shoots, or of the mature wood, with or without its leaves, which, after they have been properly prepared and planted, form roots at the lower extremity; each cutting becoming a perfect plant. In general, cuttings should be taken from those shoots of a tree which are nearest the ground, because, from the moisture and shade there, such shoots are more predisposed to emit roots than those on the upper part of the plant. The young or last-formed shoots are to be taken in preference to such as are older, as containing more perfect buds in an undeveloped state, and a bark more easily permeable by roots; and the cutting is to be prepared by severing its lower extremity at a joint, the lenticills or root-buds being there most abundant. When the cutting is planted, the principal part of the art consists in making it quite firm at the lower extremity, so as completely to exclude the air from the wounded section. Cuttings emit roots at this section, either in consequence of the action of the accumulated sap in the cutting, as in the case of ripened wood

in deciduous trees and shrubs ; or in consequence of the joint action of the accumulated sap of the leaves, as in the case of cuttings of soft wood, with the leaves on and in a living state. Cuttings should be planted in the same season as I have recommended for layering. The trees which are most generally propagated by means of cuttings are several species of plane, elm, poplar, and willow. Very few timber-trees are increased by this mode, as it is very hard to raise a fine straight tree from either layers or cuttings.

When the plants have attained to a fair share of strength and vigour, the next subject which requires the planter's attention will be the process of thinning, or reducing the number of seedlings, with a view to those which remain attaining a more mature growth. Natural woods are also thinned for the same purpose. The operation ought to be commenced as soon as the extreme leaves or branches are nearly touching one another ; and continue till the plants have attained their full growth, or the required dimensions or age. On no account should the branches of any one seedling-tree, in a nursery or plantation, be allowed to touch the branches of any other tree ; because, in that case, the foliage is deprived of its due proportion of light, solar heat, air, and aqueous moisture, and the tree is drawn up in height, at the expense of its thickness and vigour to resist storms, while the timber produced will be diminished both in

quantity and quality. It has been well observed by a recent writer, that there is no department of planting less understood than the subject of sheltering young plantations; and it may with truth be said, that, in by far the greater number of cases, nothing is ultimately gained by drawing up trees in masses, and afterwards thinning them out. The trees left being unprepared, both by their bark and roots, for the new atmospherical circumstances in which they are placed, receive a greater check than if they had been originally planted so thin, as at no period of their growth to touch one another.

One of the rules laid down for thinning plantations, is to keep the distance of the trees from one another, equal to one fifth of their height; but this is a very unsafe criterion, and the eye and judgment will usually be the best guides. In plantations, thinning should be repeated about every seven or ten years, as the growth may be, or the case may require, so as to prevent the tress from crowding and injuring each other, and to afford proper space for their full growth and increase.

The following table shows the number of trees to be cut out in thinning woods, and the number left standing, at every period of four years from twenty to sixty-four years, reckoning that the distance of trees from each other should be one fifth of their height, and that the trees

have increased fifteen inches in height and one inch and a half in circumference annually, and to have been at first planted four feet apart.

TABLE.

<i>Age.</i>	<i>Height.</i>	<i>Girt.</i>	<i>Contents.</i>			<i>Distance.</i>	<i>No. of Trees on an acre.</i>	<i>Contents of the whole.</i>	<i>No. to be cut.</i>	<i>Contents.</i>
<i>yrs.</i>	<i>feet.</i>	<i>inch.</i>	<i>ft.</i>	<i>in.</i>	<i>pts.</i>	<i>feet.</i>		<i>feet.</i>		<i>feet.</i>
16	20	3	1	3	0	4	2722	3402	980	1225
20	25	$3\frac{3}{4}$	2	5	3	5	1742	4246	532	1296
24	30	$4\frac{1}{2}$	4	2	7	6	1210	5100	322	1357
28	35	$5\frac{1}{4}$	6	8	4	7	888	5944	208	1392
32	40	6	10	0	0	8	680	6800	143	1430
36	45	$6\frac{3}{4}$	14	2	10	9	537	7644	102	1452
40	50	$7\frac{1}{2}$	19	6	4	10	435	8494	75	1464
44	55	$8\frac{1}{4}$	25	11	10	11	360	9355	58	1507
48	60	9	33	9	0	12	302	10192	45	1518
52	65	$9\frac{3}{4}$	42	10	10	13	257	11026	35	1501
56	70	$10\frac{1}{2}$	53	7	0	14	222	11895	29	1553
60	75	$11\frac{1}{4}$	65	10	11	15	194	12720	23	1515
64	80	12	80	0	0	16	170	13600		

We come now to speak of transplanting. In removing young plants from the seed-bed to other reserve grounds in the nursery, care should be taken not to sever or mutilate the roots, unless they are very disproportionate and unwieldy; for, although the tap-root may sometimes require to be shortened, every radical lateral shoot is of essential importance to the well-being and future growth of the tree. The young plants are generally removed when they have

attained two or three years' growth, and they are usually first sorted into different sizes, so as to attain a comparative uniformity of growth.

Large trees of fifteen or sixteen years' growth may be transplanted by judicious management. Those on which the experiment is most frequently tried, are, the English elm (which will bear transplanting better than any large tree), the lime, the oak, ash, hornbeam, sycamore, and chestnut.

The annexed table gives the number of plants required for one acre of land, at the varied distances of from one foot to twenty-one feet apart from plant to plant.

TABLE.

<i>Distance.</i>		<i>Number.</i>	<i>Distance.</i>		<i>Number.</i>
FT.	IN.		FT.	IN.	
1	0	43,560	8	6	600
1	6	19,360	9	0	537
2	0	10,890	9	6	482
2	6	6,969	10	0	435
3	0	4,840	11	0	360
3	6	3,556	12	0	302
4	0	2,722	13	0	257
4	6	2,252	14	0	223
5	0	1,742	15	0	194
5	6	1,440	16	0	171
6	0	1,210	17	0	151
6	6	1,031	18	0	135
7	0	889	19	0	121
7	6	775	20	0	109
8	0	680	21	0	99

Locality, climate, soil, and situation are subjects of primary consideration, which should always be taken into account by the planter. If he carefully examine the geographical distribution of the vegetable kingdom, he can never err in judgment as to what trees are suited to the neighbourhood; and an attentive enquiry into the nature of the soil, the mean temperature and elevation above the level of the sea, &c., will further materially assist him in selection, and reward him for his labour, by ensuring a profitable result.

At the equator, we find the natives of the Spice Islands, the clove and nutmeg trees, pepper, and mace. Cinnamon bushes clothe the surface of Ceylon: the odoriferous sandal-wood, the ebony-tree, the teak-tree, the banyan, grow in the East Indies. In the same latitudes, in Arabia the Happy, we find balm, frankincense, and myrrh, the coffee-tree, and the tamarind. But in those countries, at least in the plains, the trees and shrubs which decorate our more northerly climes are wanting. And as we go northwards, at every step we change the vegetable group, both by addition and subtraction.

In the thickets to the west of the Caspian Sea, we have apricot, citron, peach, and walnut. In the latitude of Spain, Sicily, and Italy, we find the dwarf plum, the cypress, the chestnut, and the cork-tree: the orange and lemon tree

perfume the air with their blossoms : the myrrh and pomegranate grow wild among the rocks. We cross the Alps, and we find the vegetation which belongs to northern Europe, of which England is an instance. The oak, the beech, and the elm, are natives of Great Britain : the elm common in Scotland and the north of England is the wych elm. As we travel still further to the north, the forests again change their character. In the northern provinces of the Russian empire, are found forests of the various species of firs—the Scotch pine, spruce fir, and the larch. In the Orkney Islands no tree is found but the hazel, which occurs again on the northern shores of the Baltic. As we proceed into colder regions, we still find species which appear to have been made for these situations. The hoary or cold elder makes its appearance north of Stockholm : the sycamore and mountain-ash accompany us to the head of the Gulf of Bothnia : and as we leave this and traverse the Dophrian range, we pass in succession the boundary-lines of the spruce fir, the Scotch pine, and those minute shrubs, which botanists distinguish as the dwarf birch and the dwarf willow.

Having thus adverted to the geographical distribution of forest-trees, I come now to speak of the particular localities and description of soils, best suited to the healthy and mature growth of different trees in our variable climate. In low moist lands, the alder, birch,

abele, poplar, tamarisk, laurel, box, willow, sallow, and osier, will flourish best. On peat-soils which have been drained, the abele, poplar, birch, willow, and alder, may also be very successfully cultivated. The beech, ash, and oak tenant the chalks; and the elm, ash, oak, Norway spruce, pinaster, and hornbeam, are best suited for the clays.

On peat-soils, resting on silicious sand, the pine, birch, beech, larch, spruce, and sycamore will flourish. On a similar soil incumbent on clay, or if the surface-soil be a clayey loam, the oak will grow rapidly.

The sycamore, laburnum, yew, and pinaster have been found to withstand the bleak sea-blasts better than many other trees; but the most profitable trees for elevated and exposed situations are the sycamore, mountain ash, birch, larch, Norway spruce, and Scotch pine or fir. I shall have occasion to revert to this subject in future remarks.

However beneficial manure may be to the early growth of seedlings, shrubs, and tender exotics, they seldom require any stimulating application when they have arrived at a strong and vigorous growth. The due preparation of the soil, however, for planting is of primary paramount importance; and has been well and ably enforced both by precept and example, in the

publications of Mr. WITHERS, whose practical knowledge and experience must add additional weight to his recommendation. The vulgar error, which presumed that the roots of a tree could expand and obtain nourishment for its successful after-growth, in a rude hole made with the mattock or dibble in an unprepared tenacious soil, is happily nearly exploded. Deep trenching and the mixture of soils are now receiving that due share of attention to which they are so justly entitled. If it be desirable and profitable to plant at all, it must be desirable to do it well, and to take into consideration all the influencing circumstances of soil and situation.

Strong aluminous soils should be deeply trenched, and dressed with sand, rubbish of buildings, coal-ashes, and road-scrapings. Such soils may also have straw, thatch, litter, the earth from a wood-stack, or sawdust if it can be obtained, trenched in with them. Gravels and sands should be mixed with loam and clay.

These remarks apply principally to planting on a small scale. But lime and chalk can generally be procured in large quantities, and are excellent correctors of stiff adhesive clays. Trees, whose roots run shallow, flourish best on light dry soils; as the beech, ash, poplar, &c., on gravels—the oak and elm on brick-earth, &c. Strong tenacious soils, however, produce

the largest oak, while gravelly or shallow soils bear the finest grained timber.

Few are aware of the great advantage of watering seeds and plants, unless they have tried the experiment. Yet we know how grateful water is to the animal kingdom, and how essential to their well being. Reasoning therefore from analogy, we might infer the same results from its application to the vegetable kingdom, even if we were not convinced of its necessity and utility by every-day experience. In mature age, trees are enabled to obtain a due supply of moisture by absorption of the aqueous moisture of the atmosphere, and of the dew, &c., which the earth gives forth by evaporation, by means of the increased amount of foliage. Young plants and trees, having but few leaves, are necessarily dependent for a due supply of moisture chiefly to the spongioles of the root, and the absorbent power of the outer bark (*epidermis*).

If, after a long drought, a fog happens to succeed before any rain falls, so as to moisten the surface of the leaves, plants begin to revive and to resume their verdure, long before any moisture can have penetrated to their roots. Hence it follows incontestibly, either that moisture has been absorbed by the leaf, or that exhalation has been suddenly stopped by closing the pores of the leaf, or both. The efficacy of rain and of artificial waterings may be accounted for

partly on the same principle ; for they have not always penetrated to the root, when they are found to give freshness to the plant by either of the processes just alluded to. Absorption varies according to the state of the plants and the periods of their growth, going on more rapidly in proportion as the leafing is rapid.

The next subject which requires the planter's care, and in which much must be necessarily left to his good judgment, discretion, and experience, is lopping or pruning, and keeping in subjection and due proportion, the several limbs or branches of the trees. I am aware that this is still a disputed subject : some parties strongly advocating its necessity and utility, while others as strenuously deprecate it as useless and injurious. The truth probably lies between the two extremes ; for much doubtless may be done to assist nature, to rectify defects, to correct apparent deformities, and to add to the general health, beauty, and vigour of the tree. On the other side it is not the less true, that many trees are irreparably injured, and whole plantations rendered useless or utterly destroyed, by unskilful and indiscriminate pruning, and wholesale mutilation of leading and essential branches.

Pruning, in its legitimate sense in the culture of forests, denotes only the removal of unsightly excrescences or superfluous portions of trees, with the view of making the bole grow straighter,

higher, and with greater regularity. The ancients found such benefit from pruning, that they feigned a goddess presided over it. Almost all that can be urged in favour of pruning is contained in the valuable essays of MR. JOHN GRIGOR, and other practical men, presented to the Highland Society of Scotland.

These all agree, that pruning is beneficial and essential towards promoting the profitable growth and value of by far the greater number of hard-wood trees; but that this may be rendered less necessary in certain situations, by thick planting and judicious timely thinning. Pruning should commence when the trees are three or four years old; and should be followed up, if necessary, during the after-growth of the tree. But no general rules can be laid down on this point, which shall equally apply to all circumstances and situations. The necessity of judicious pruning appears to have been well understood by our forefathers, as is evidenced in the following extracts from a work published nearly two centuries and a half ago.

“How many forests and woods, wherein you shall have for one lively thriving tree, four (nay sometimes twenty-four) evil thriving, rotten, and dying trees, even whiles they live, and instead of trees, thousands of bushes and shrubs! What rottenness, what hollowness, what dead arms, wither'd tops, curtail'd trunks! What loads of

mosse, drouping boughs, and dying branches shall you see every where ! and those that like in this sort are in a manner all unprofitable boughs, canker'd arms, crooked, little and short boals. What an infinite number of bushes, shrubs, and skrags of hasels, thornes, and other unprofitable wood, which might be brought, by dressing, to become great and goodly trees ! Consider now the cause. The lesser wood hath been spoil'd with careless, unskilful, and untimely stowing ; and much also of the great wood. The greater trees at the first rising have filled and overladen themselves with a number of wastefull boughs and suckers, which have not only drawn the sap from the boal, but also have made it knotty, and themselves and the boal mossie, for want of dressing ; whereas if in the prime of growth they had been taken away close, all but one top, and clean by the bulk, the strength of all the sap should have gone to the bulk, and so he would have recover'd and cover'd his knots, and put forth a fair, long, and straight body, for timber, profitable, huge, great of bulk, and of infinite last."

So also in another place the same writer has the following pertinent remarks : " All ages by rules and experience do consent to a pruning and lopping of trees. We may well assure ourselves (as in all other arts, so in this) there is a vantage and dexterity by skill ; an habit, by practice out of experience, in the performance hereof for the profit of mankind : yet do I not know (let me

speaking it with patience of our cunning arborists) any thing within the compass of humane affairs so necessary, and so little regarded, not only in orchards, but also in all other timber-trees, where or whatsoever.”—*Lawson's Orchard, published in 1597.*

There is much judgment and good sense in these observations, notwithstanding the quaint phraseology in which they are dressed up; and the enlarged experience of two hundred and fifty years has added very little to the information which they afford. It is true we may plant more largely and systematically: our knowledge of vegetable physiology may be more accurate and extensive; but the broad leading principles which should regulate the planting and management of forest-trees remain the same, and were as well understood and practised by our ancestors as by ourselves.

EVELYN, another talented writer of the seventeenth century, is equally well informed on all that relates to the culture and management of timber-plantations. In his *Discourse on Forest-Trees*, read before the Royal Society, speaking of unskilful pruning, he has the following very just observations: “ ’Tis a misery to see how our fairest trees are defaced and mangled by unskilful woodmen and mischievous borderers, who go always armed with short hand-bills, hacking and chopping off all that come in their way; by

which our trees are made full of knots, boils, cankers, and deformed branches, to their utter destruction : good husbands should be ashamed of it. As much to be reprehended are those, who either begin this work at unseasonable times, or so maim the poor branches, that either out of laziness or want of skill, they leave most of them stubs ; and instead of cutting the arms and branches close to the bole, hack them off a foot or two from the body of the tree, by which means they become hollow and rotten, and are so many conduits to receive the rain and weather, which perishes them to the very head, deforming the whole tree with many ugly botches, which shorten its life and utterly mar the timber.”—*Evelyn’s Sylva*, 1st edit. 1664, p. 74.

Close pruning, snag-pruning, and cutting in or fore-shortening, are usually applied solely to timber growing in hedge-rows.

Much of the success of pruning depends upon the manner in which it is performed. Branches which are to be amputated should be cut off clean, smooth, and close, making the stroke upward, and with a sharp bill, so that the weight of an untractable bough may not splinter and carry away with it portions of the bark from the bole, which is both dangerous and unsightly. Although most planters agree in the advantage of preserving one leading shoot, yet it is an erroneous practice to cut away all the side branches at

once ; and the removal of large boughs should always be avoided as much as possible. Hard-wood trees are generally much benefitted by skilful pruning ; but the pine-tribe—spruces larches, and firs—do not admit of being pruned at all, unless under very peculiar circumstances, and then only with great care and judgment. The Scotch fir or pine stands pruning the best. COLONEL MILLER, in advanced stages of the well-known disease, termed American blight, incidental to the larch, recommends free and early pruning. This doctrine may startle many wood growers ; but the COLONEL, in proof of the soundness of his opinion, adds, that he has adopted it successfully for many years. No large branch should, however, be removed when the tree is near maturity. The Swedes and Norwegians prune their pine-trees freely, and hence the reason why they produce such a large quantity of sound timber, and so free from knots.

Every species of tree should be pruned as near the spring months as its nature will permit. A practical writer in the *Quarterly Journal of Agriculture*, vol. 3, new series, writing on this subject, says, “With regard to the proper season for shortening and cutting off the branches, I conceive that after the fall of the leaf in autumn is the best period for shortening the branches. I have made many experiments in order to ascertain the proper period for pruning or cutting off

the branches. I have performed it in March, May, June, July, and other periods of summer, and in autumn; but I always found, that the earlier in spring the pruning was performed, the part was the sooner cicatrized, and the tree did so much the better afterwards. This I found to be the best period for trees in general: but the sycamore and birch should be pruned in January, the Scotch fir in September or October, and the larch may be divested of its decayed branches at any period when it can be done with a blunt instrument."

The pruning of timber-trees has had many warm advocates, especially in Scotland; and no one, perhaps, has explained the real or imaginary advantages of the system more clearly than MR. CREE. He observes:—"To manage woods in a proper manner, young trees should be examined well the third year after they are planted; and if any more leading shoots than one are found to exist, the best one should be selected, and the others shortened to one half the length of the selected shoot. This practice of examining the trees should be continued every year, till they are about fifteen feet in height. These shortenings, however, must not be confined to superfluous leading shoots, but extend to any branch which is gaining a disproportionate ascendancy over other branches of the same year's growth. At first, and for some time previous to this stage of the growth of the plant, the shortening should

be more cautiously performed, than is necessary to be observed afterwards, and should increase in severity as the tree approaches to and after it is fifteen feet in height."

The process of examining a tree is a simple one: it is done in a moment, by the pruner casting his eye over the whole trees, and detecting the branches which require to be shortened. And as a general rule, where it is found that any branch has a greater growth upon it than the leading shoot, it should be shortened by cutting off as much as will reduce it to half the length of the leading shoot, or even less. Authors differ much regarding the mode of cutting off the branches. By some it has been recommended to leave snags in pruning—that is, to spare a few inches between the stem and the part at which the branch is cut off. This I conceive to be a bad system. Even granting that trees suffer much by bleeding, as it is called, especially resinous trees, when cut close to the stem, still that bleeding will soon be prevented by the wound being cicatrized. Now there are two evils attending the practice of leaving snags. In the elm, Scotch fir, and many other trees of considerable size, an effort is made by the tree to cover over the snag long before the annual growth of the tree arrives at this magnitude: the consequence of which is, that a large knot in the wood is formed, thus defeating one of the principal objects which it is the province of pru-

ning to accomplish. But another evil consequent upon this practice, where no effort is made by the tree to cover it until the annual increase of the albumen circle shall have done so, is, that the snag, in resinous trees in particular, is always liable to bleed until it is cicatrized; or, when the snag has lost its vitality, it soon becomes liable to rot. From this latter circumstance, results the danger of after finding large trees, when cut down, though apparently sound on the outside, rotted in the interior. Such is frequently the case with snags, even in middle-sized trees. When large branches too are amputated from old trees, before the growth of the tree can cover the part, it has become rotted; and, by exposure to the atmosphere, moisture is carried down the pith of the tree, which commences the work of decomposition, spreading to the adjoining parts of the wood.—*Johnson's Farmers' Encyclopædia.*

It would seem that, after a certain age, all trees decrease in their rapidity of growth, a fact of some importance to be known to planters: the oak for instance between its fortieth and sixtieth years, the elm after its fiftieth, the spruce after its fortieth, the yew after its sixtieth: of this rate of growth M. DECANDOLLE has constructed the following table.

*Table of the Rate of Increase in Diameter of
certain exogenous Trees.*

Years.			Oaks.		Larch.	Elm.	Spruce.	Yew.
			Common Oak, <i>Q. pedunculata.</i>	Sessile fruited bay Oak. <i>Q. sessiliflora.</i>				
1	to	10	54	10	48	16	41	8
10	—	20	62	16	61	44	54	11½
20	—	30	54	22½	58	58½	52	12
30	—	40	60	12	72	72	45	10½
40	—	50	48	13½	46	88	35½	7
50	—	60	44	14	57	74	36	12½
60	—	70	56	10¾	46	78½	18	8
70	—	80	44	11	29	66	17	
80	—	90	32	9½	30	59	13	
90	—	100	32	9½	24	45	13	
100	—	110	30	9½	32	30	22	
110	—	120	36	9	26	30	22	
120	—	130	30	9½	20½	24		
130	—	140		10	22	24		
140	—	150		8½	23	18		

When your timber has attained its full growth, or the age at which you intend to fell it, if your plantation be thick of wood, then fell the timber-trees, and cut the underwood as close to the ground as you can; but if your wood be thin, then stock up your trees, especially if the timber be large.

Leave sufficient young trees in your plantation to come on in succession to those which you fall.

When a tree is at its full growth, there are several natural signs of its decay, which serve as indications that it should be felled before it becomes totally decayed : such as in the oak, when the uppermost boughs begin to wither ; in the elm and ash, when the head dies, or the wet soaks in at any knot and discolours the bark, which is the commencement of hollowness and decay.

All branches or limbs that may injure the trees in their fall ought previously to be lopped, and the trunk should be cut down close to the ground, unless it be grubbed or rooted up, which latter method is preferable, because timber produced from old stocks is of inferior value.

The term “ felling ” is only used in respect to full-grown trees, and is never applied to young trees, nor to bushes, underwood, or hedges. Much has been written respecting the proper season for felling trees, some arguing in favour of mid-winter, and others in favour of mid-summer. The question principally turns upon the quantity and the value of the soft or outer wood in the trunk of the tree to be felled, known by foresters and carpenters as the sap-wood. As this sap or outer wood is the only portion of the trunk in which the sap or juices of the tree flow, it is evident that, if no value be set upon it, the tree may be cut down at any season ; because the

truly valuable part of the trunk, the mature timber, is impermeable to the sap in its ascent through the soft wood, and is therefore in the same state at every season of the year. On the other hand, where much value is attached to the soft or outer wood—where this outer wood is to be made as valuable as possible—or where, as in the case of comparatively young trees, the greater part of the trunk consists of sap-wood, felling ought to take place when there is least sap in the course of ascending. This season is without doubt mid-winter, which, all other circumstances being equal, is unquestionably the best season for felling timber; the next best being mid-summer, when the sap is chiefly confined to the young shoots, the circumference of the soft wood, and the bark. The worst time for felling timber is the spring, just before the development of the buds, when the tree is fullest of sap, and receiving constantly fresh supplies from the root; and in autumn, immediately before the fall of the leaf.

In general all the soft woods, such as the elm, lime, poplars, willow, &c., should be felled during winter: hard wood, like the oak, beech, ash, &c., when the trunks are of large size, and valued chiefly for their heart-wood, may be felled at any time. When the bark, however, is to be taken into consideration, as in the oak, the tree should be felled in spring, or about May and June; for then the bark contains four times

the quantity of astringent matter (tannic acid) to that felled in winter.

Besides those trees reserved for timber, much underwood and stub-wood is grown in different parts of the country in coppices, thickets, and hedge-rows, and the produce applied to various useful and profitable purposes. The principal demand is for fire-wood, in the shape of bavins, bakers' faggots, cord-wood, &c.; or for fences, hop-poles, and charcoal. No general rule can be laid down to regulate the cutting of coppice-wood. Nine years is however considered to be the shortest period, and those of fourteen or fifteen years are best for the axe; but much will depend on the purpose to which the produce is to be applied. The larch, birch, oak, and alder are the trees usually grown in coppices. The value of the common chestnut for coppice-wood is however well known. In fenny lands, where the soil is moist and cannot conveniently be drained, osier-holts may be formed, which will yield considerable profit in osiers for baskets, hoops, &c. Care should be taken to select the best and most suitable species of sallow and willow, for some varieties are utterly worthless from their brittleness. The most esteemed species are the velvet osier (*Salix viminalis*, var.), and the fine basket-osier (*S. Forbiana*).

Although an osier plantation may be formed at any time, the best season to commence it is

from the fall of the leaf till very late in the spring. The soil may be moor or clay, or any that is low and wet. The mode of planting is very simple : it is first to dig the land from six to twelve inches deep, and then to prick down cuttings of four years' growth, and eighteen inches long, at about three feet distance from each other.

A few words on the management of hedges may not be out of place here. The living fences most generally used in agriculture are the whitethorn (quickset), because it has spiny branches, and forms a strong defence against cattle ; and when kept well cut, it forms hedges scarcely less impregnable than those composed of holly. The common elder (*Sambucus nigra*), the blackthorn (*Prunus spinosa*), furze, holly, hornbeam, and other shrubs and plants, have been from time to time recommended for constructing hedges ; but none of these have come into very general use. The blackthorn is not reckoned so good for this purpose as the hawthorn, because it is apt to run more into the ground, and is not so certain of growing : however cattle are less likely to crop fences of elder and blackthorn than those of the whitethorn. The REV. MR. FARQUHARSON, in a valuable essay, has advocated the cultivation of the elder for hedges, from its rapidity of growth, hardihood, and cheapness. The principal objection to it appears to be that it does not thicken and close up its branches, so as to form an impervious fence like the whitethorn. Furze

(*Ulex Europæus*) is chiefly used for hedges on waste sterile soils, particularly those which are dry, sandy, and gravelly, where it grows better than other shrubs. With common care furze fences last for a very long period, but they require judicious management to prevent the roots becoming exposed. Sowing the seed in three tiers on a bank is recommended as the best mode, as the plants can be kept at different heights by the bill, so as to form a thick hedge. There are generally two objections advanced against the adoption of whin-fences. The first is, that the wall or mound required for raising the whin is of such dimensions, as to occasion a great waste of ground; and the second is, that the whins have a tendency to spread over and injure the adjoining grounds. But with a slight well-trimmed wall-fence of furze, these objections may easily be obviated.

In the management of hedges of every description, an important point is to keep them thick and impervious to wind or animals, near the ground; for which purpose, the section of the hedge requires to be made broader at the base than at the top, in order that the exterior leaves in every part of the hedge may enjoy, in an equal degree, the influence of light, air, and perpendicular rains.

MR. FRANCIS BLAKIE'S little work "*On the Management of Hedges and Hedge-row Timber*,"

contains much useful practical information on this subject. Beech, ash, and fir are not only ruinous to fences, but are also otherwise injurious to farmers: oaks, the common narrow-leaved elm (*Ulmus campestris*), and the black Italian poplar (*Populus monilifera*), do comparatively little injury, and will be found more profitable hedge-row timber. Quickset-hedges require to be kept trimmed with the shears or bill.

Plashing is a mode of repairing or modifying a hedge, by bending down a portion of the shoots, cutting them half through near the ground to render them more pliable, and twisting them among the upright stems, so as to render the whole effective as a fence; and at the same time preserve all the branches alive. For this purpose, the boughs to be plashed or bent down must not be cut more than half through, in order that a sufficient portion of sap may rise up from the root to keep alive the upper part of the branches. Where hedges are properly formed and kept, they can seldom require to be plashed; but this mode of treating a hedge is most valuable in the cases of fences abounding with hedge-row timber, when, from neglect or from any other cause, the hedge has become of irregular growth.

In gardening, the fences, for the purposes of shelter and separation, are for the most part formed of evergreen shrubs, such as the holly,

yew, box, &c. ; or sub-evergreens, such as the privet ; of flowering shrubs, such as the *Cydonia Japonica*, and rhododendron ; or of deciduous shrubs or trees with persistent leaves, such as the hornbeam and beech.

For the lawn and shrubbery, the well known arbor vitæ, the lilac, and the laburnum, are general favorites. The common laurel (*Cerasus lauro-cerasus*), one of our most popular evergreen shrubs, is now as universal in shrubberies as the rose, with its thousand admired species and varieties. The Portugal laurel (*Cerasus Lusitanica*), which forms a round head, is very ornamental on lawns. The most interesting and hardy of the laurel tribe is the common bay-tree (*Laurus nobilis*): it thrives under the very wings of larger trees, where it is difficult to make other shrubs prosper, and this is of importance in our plantations. These shrubs are usually propagated by cuttings. The laurel, and all ornamental evergreens, should be transplanted in September or October, the ground having been previously well saturated with moisture. Evergreen shrubs will seldom succeed if planted very early in the autumn ; and if planted later than February, and the season prove dry, they will not have power to establish themselves, and many will perish.

The species of *Cytisus* or laburnum are propagated by seed. The sweet gum-tree, *Liquidambar styraciflua*, the maiden-hair-tree (*Salisburia*

adiantifolia), the new scarlet thorn, a beautiful variety of the common hawthorn, the white beam-tree (*Pyrus aria*), *Virgilia lutea*, the Italian cypress, and *Pinus cembra*, are all deserving of a place in the shrubbery, or on an extensive lawn or pleasure-ground.

Among the trees which are more adapted for their size and beauty to produce a striking effect in landscape gardening, are the Turkey, the Luccombe, and the cypress oaks, the holly, the cork-tree, the oriental plane, the horse-chestnut and the Spanish chestnut, the lime-tree, several species of ash and maple, the Robinia or false locust, the weeping willow, the Lombardy poplar, the evergreen or holm oak, the cedar of Lebanon, the Scotch fir, the silver fir, and other species of *Pinus* and *Abies*.

About a century ago, there were only twelve kinds of evergreens grown in this country. We now cultivate more than four thousand hardy trees and shrubs, and the number is daily on the increase. It is therefore quite impossible to give anything like a list, which shall embrace even a fair selection of those desirable for cultivation. The following, however, comprises, an extensive assortment of elegant shrubs for ornamental planting, most of which will thrive in the open air under certain precautions: arbutus, clematis, fuchsias, dwarf-almond (*Amygdalus nana*), red American upright honeysuckle (*Azalea nudi-*

flora) and other species of azalea, rock-rose (*Cistus ladaniferus*) arborescent bladder-senna (*Colutea arborescens*), several species of cytissus, spear-leaved daphne or spurge laurel (*Daphne Laureola*), Syrian mallow-rose (*Hibiscus Syriacus*) and its varieties, Irish heath (*Menziesia polifolia*), dyer's green weed (*Genista tinctoria*); the narrow leaved, broad leaved, hairy, glaucous, and other species of kalmia; shrubby and round leaved rest-harrow (*Ononis fruticosa* and *rotundifolia*), rough false acacia (*Robinia hispida*), musk rose (*Rosa moschata*), scarlet bramble (*Rubus odoratus*), Spanish broom (*Spartium juncum*), common laurestine (*Viburnum Tinus*), hydrangeas, myrtle, holly, jasmine, juniper, lavender, magnolia, rhododendron, tamarisk, wisteria, passion flower, knee holly or butcher's broom (*Ruscus*), kolreutera paniculata, &c.

In designing and laying out pleasure-grounds and shrubberies, much will depend on the good taste and judgment of the designer, in grouping and arranging the trees. From the garden and parterre, the lawn should glide insensibly into the more distant ground, occupied by the shrubberies and the park. Here the genius of the place dictates the arrangement of the levels, and of the masses of trees and water. Common sense is followed in planting such trees only as are suited to the soil. A knowledge of the tints of their foliage guides the landscape-gardener in associating them, and aids the laws of perspec-

tive in lengthening his distant sweeps. If gentle undulations mark the surface, he leads water among their subdued diversities, and blends his trees in softened groups, so as to form light glades to harmonise with the other parts. If high and broken ground has to be adorned, the designer mingles waterfalls with broader masses of darker foliaged trees, and acquires the beauty peculiar to the abrupt and the grand, as in the former he aimed at that which is secured by softer features.

Avenues of trees sometimes add to the interest and beauty of a park-entrance, and take off from the monotony of a long carriage drive. These kinds of alleys or walks were formerly much more the taste for gardens and parks than at present. When they are to be made, the common elm answers very well for the purpose in most grounds, except such as are very wet and shallow, and is preferred to most other trees, because it bears cutting, heading, or lopping in any manner. The rough, or Dutch cork-barked elm (*Ulmus major*) is approved by some, because of its quick growth; and it is a tree that will not only bear removing very well, but it is green in the spring, almost as soon as any plant whatever, and continues so equally long. It is preferable to all other trees for lofty espaliers, and makes an incomparable hedge, for which purpose it was in fashionable repute when first brought over from Holland in King

William's reign, although it has now fallen into disuse. The lime is also in high esteem for avenues and parks, on account of its regular growth and fine shade. As an ornamental tree in picturesque gardening, the lime is always well worth cultivating, since it ranks in the first class in point of magnitude, frequently attaining to a height of eighty or ninety feet, with a trunk corresponding to such an altitude. The lime bears cropping with comparative impunity; and hence, on the continent, pyramids, arches, and colonnades are frequently formed of this tree, which sometimes produce an imposing effect. The horse-chestnut is proper for such places as are not too much exposed to rough winds. The common or sweet chestnut does very well on poor gravelly or sandy soils, and will thrive on any but moist or marshy situations. It rises to a considerable height when planted somewhat close, but when it stands single, it is rather inclined to spread than grow tall. The beech naturally grows well with us in its wild state, but it is less to be chosen for avenues than others, because it does not bear transplanting well, being very subject to miscarry. The abele tree is very suitable for this purpose, as it is adapted to almost all soils, and is the quickest grower of any forest-tree. It seldom fails in transplanting, and succeeds very well in wet soils, in which the others are apt to fail. The Lombardy poplar and common grey or white poplar, as ornamental trees, are not

worthy of a place in extensive parks and grounds, particularly when planted in low situations or near to water: they ought however to be grouped and massed with trees of equally rapid growth, or they will else soon become disproportionate, and out of keeping with those whose progress is comparatively slow. The oak is but seldom used for avenues because of its slow growth.

The old method of planting avenues was by regular rows of trees, a practice which has been adhered to till lately; but now, when they are used, a much more ornamental mode of planting them is adopted, which is by setting the trees in clumps or platoons, making the opening much wider than before, and placing the clumps of trees from one to three hundred feet distant from each other. In these clumps there should always be planted either seven or nine trees; but it must be observed, that this method is only proper to be practised where the avenue is of considerable length, as in short walks such clumps will not appear so sightly as single rows of trees. The avenues made by clumps are the most suitable for large parks. The trees in the clumps in such avenues should be planted thirty feet asunder; and a trench thrown up round each clump to prevent cattle or deer from coming to the trees and barking them.

The various characters and ornamental ap-

pearances of trees are well described by GILPIN, in his picturesque work on Forest-Scenery. They have attracted the notice of poets as well as natural historians of almost every age: HOMER, VIRGIL, LUCAN, OVID, TASSO, SPENSER, and MILTON, not to mention innumerable modern poets, have all of them very fine passages, in which the distinguishing appearances and special characters of trees are described.

The diseases, infirmities, and casualties to which forest-trees are subject, are very numerous. In their early growth, as I have already shown, they are liable to be smothered by weeds. The most formidable accidents, however, are those arising from the attacks of insects; from the war of elements, lightning, and heavy winds; from incipient decay, unfavourable soils, canker, parasitical plants, extravasated sap, the consequence of bleeding, and injudicious and unreasonable pruning.

The parasitical plants, which are most injurious to forest-trees, are lichens, mosses, the ivy, mistletoe, traveller's joy, bryony, bramble, &c., which infest and encumber the bark, trunk, or limbs. Mosses and lichens are generally the consequence of a want of free circulation of air, or result from damp soils. Suckers where they are numerous detract from the strength and vigour of the parent-tree.

The elm, oak, larch, and wild pear-tree, or beam-tree, are those most subject to canker or ulcer. This disease commences with an enlargement of the vessels of the bark of a branch, or of the stem. The soil has a very considerable influence in inducing the disease. If the subsoil is a ferruginous gravel, or if it be not well drained; if the soil is aluminous and effective means are not taken to free it of superabundant moisture, the canker, under any one of these circumstances, is almost certain to make its appearance among the trees. Pruning has a powerful influence in preventing the occurrence of canker. If two or three of the main branches are removed, and the laterals of those remaining carefully thinned, all the infected parts at the same time being removed, the result will be a total cure.

Deer, hares, and rabbits injure and wound the bark. Caterpillars prey on the leaves, and birds on the young buds.

The bark of trees is best cleansed from the parasitical mosses, with which it is wont to be infected, by being washed with lime-water, or a solution of common salt in water (four ounces to a gallon), applied by a plasterer's brush. Trees that are bark-bound may be cured by making a longitudinal slit through the bark: where the gaping which will result is very considerable, it

may be filled up with cow-dung or any other similar composition.

In noticing the principal insects which prove injurious and destructive to woods and forests, I shall follow the admirable arrangement of M. KOLLAR, and divide them into two classes. I. Those which attack broad-leaved deciduous trees, or narrow-leaved trees. II. Those which attack evergreens. And it should be remarked, that few insects use both kinds for their food.

I. *Those which attack deciduous trees.* The cock-chaffer, or may-bug (*Melolontha vulgaris*), preys on most of the deciduous trees, particularly the oak, willow, hazel, and many fruit-trees: also young fir-trees; but it never touches the lime-tree. Pigs, moles, field-mice, and a multitude of birds, are the natural enemies of these grubs, and keep them within due bounds.

The satin-moth (*Porthesia Salicis*, STEPHENS.) is a very great enemy to the willows, and to all kinds of poplars.

The buff-tip moth (*Bombyx bucephala*, AUTOR) is one of the few insects which attack the lime: it nevertheless is found on other deciduous trees, such as the oak, beech, birch, alder, and willow, and even on roses and fruit-trees. Sometimes these insects appear in such numbers that the tree or shrub they attack is completely

stripped of its leaves, as, on account of their magnitude, they require a great deal of nourishment to enable them to attain their full size.

The oak occasionally suffers considerably from the ravages of the caterpillars of one of the small species of *Tortricidæ* (*Tortrix viridana*). These caterpillars ingeniously curl up the leaves of the oak, fastening them with silken threads; thus constructing, not only an abode, but securing a supply of food. In some seasons they are so numerous as entirely to defoliate oak woods, and upon beating the bushes whole showers of the moths are shook into the air. Besides these there are many which are injurious to different kinds of deciduous trees, particularly the caterpillars of many moths, which are satisfied with almost any kind of deciduous tree; for example the yellow-tail moth (*Bombyx chrysorrhæa*), the lacquey-moth (*B. neustria*), the gipsy-moth, (*B. dispar*), the goat-moth, (*B. ligniperda*), the latter of which, as well as the wood leopard-moth (*B. æsculi*), live on the wood, and not on the foliage.

II. *Insects destructive to the pine and fir-tribe.* Insects are injurious to different species of the pine and fir—1st. By eating off the foliage, from which the tree, particularly when much stripped, begins to decline, or dies completely off. 2nd. When they use the young shoots for their dwellings and nourishment; and

the tree is thereby, not entirely killed, but much damaged and retarded in its upright growth. 3rd. When they injure the epidermis and inner bark and even penetrate the wood. 4th. When they cut off the roots of the young trees, and thereby cause their death.

The caterpillars of some of the smaller moths of the genus *Tortrix* (leaf-rollers) and the larvæ of several saw-flies, are the only insects which select the foliage of the Scotch and Austrian black pines (*P. sylvestris* and *nigricans*), and also the spruce and silver firs (*Abies alba* and *picea*), for their dwelling and nourishment; and when they are unusually abundant, they occasion the greatest destruction among those trees. The most dangerous are the black arch-moth (*Bombyx monacha*) and the pine saw-fly (*Tenthredo pini*).

Pine and fir forests sometimes sustain great damage from the well-known and much-dreaded bark-beetles, several weevils, a few long horned beetles (*Cerambyx*, LINN.), and the large species of the genus *Sirex*, LINN., which injure the liber, the parenchyma, the cambium, and even the wood.

The following insects are the most destructive of the two genera of bark-beetles, *Bostrichus* and *Hylesinus*. The typographic bark-beetle (*Bostrichus typographus*), which is the

most destructive of all the bark-beetles. It particularly attacks the silver firs; but when that tree is not abundant, or when the number of caterpillars is very great, they find their way to other species of firs and pines. The following are also injurious: the pinaster or red bark-beetle (*Bostrichus Pinastri*), the larch bark-beetle (*B. laricis*), the spruce fir bark-beetle (*B. orthographus*), the Scotch pine bark-beetle (*Hylesinus piniperda*), the pine-weevil (*Curculio Abietis*), the branded weevil (*C. notatus*), the conjuring beetle (*Rhagium inquisitor*), and the great sirex (*Sirex gigas*).

The means of protection from the injuries of these depredators consist, first in methods for prevention, and secondly in methods for lessening the number of, or for destroying the insects themselves.

In adopting methods of prevention, M. KOLLAR very justly suggests—1. That attention should be paid to encourage the increase of all the natural enemies of the beetle and its larvæ, to which belong the different kinds of insects, worms, burrowing wasps, ants, and birds, particularly the finch, the tomtit, and woodpecker, which are more eager after the beetle than the grub, and which in this respect are the most effectual destroyers.

2. Attentive search should be made among

the trees during the summer-months ; and when numerous borings of the bark-beetle are perceived on declining trees, they should be felled, and the search repeated at short intervals among the others. The bark of every tree found to contain a new brood, should be carefully taken off, and burnt with the insects. As the beetle, from its natural instinct, retires to the trunks of felled trees and places her brood there, this brood may be destroyed in the easiest manner by stripping off the bark. This method put in practice at the right time, is sure to succeed in extirpating the insect, if continued until beetles are no longer found on the trunks of newly-felled trees. The stripping off the bark, however, from these trees, ought not to be neglected at the proper time, otherwise the evil would not fail to return.

3. Regular and well-arranged forest-management, including lopping to prevent accidents from wind ; frequent examination of the trees ; the quickest possible stripping or uprooting of those found to be infested ; the speedy cutting up and conveying out of the plantation of the wood intended for fuel, or that which is broken off by the wind ; and the felling and carrying off all useful timber before the month of May, if possible.

When the bark-beetles have already become numerous, the best method that can be adopted for their destruction will be—1. Felling the first bored stems without delay, and burning them

into charcoal, or conveying them out of the wood as soon as possible, or at least pulling off the bark, which should be carefully burnt. 2. The application of all preventive measures, particularly by the more frequent felling of a number of attacked trees.

Some portions of the produce of plantations have already been incidentally glanced at, in treating of timber-trees, underwood, &c.; but I come now to speak, in due course and more in detail, of the advantages and value of plantations, and the profit accruing to the cultivator and to the country at large from a more extensive and general system of planting. Setting aside the individual profit which results from a liberal outlay and expenditure under this head of improvement, in the large returns of capital obtained, the amelioration of climate, and the beautifying of an estate, by bringing into cultivation large tracts of land unfitted for the growth of ordinary crops; the utility of timber-plantations to a commercial nation is very great, as by the quantity of timber they afford for building, machinery, agricultural implements, and other purposes, a considerable expense may be saved, which must otherwise be incurred by the importation of suitable materials.

Besides the valuable timber and underwood for fuel and the purposes of carpentry which they afford, trees are sources of profit—

1. As affording bark and hence tannin, so useful in the arts, charcoal, turpentine, hoops, poles for supporting hop-bines, gate-posts, &c.

2. Some species serve as nurses and shelter for other trees, and also for many of the commonly cultivated crops, when planted as hedge-row timber, exclusive of their usefulness for ornament, which I have already adverted to.

3. Many trees, such as the walnut, chestnut, mulberry, quince, medlar, &c., are valued for their fruit as well as for other useful properties.

The trees most valued for their bark, as affording tannic acid in the manufacture of leather, are the oak and Bedford and Leicester willows; but other barks, such as that of the Spanish chestnut and the larch, are occasionally employed. The inferior quantity of tannin they yield is, however, evidenced from the experiments of SIR H. DAVY, who found that four hundred and eighty pounds of the bark of different trees afforded the following proportions of tannin :

	<i>lbs.</i>
White interior cortical layers of oak bark	72
Leicester willow (large size)	33
Coppice-oak	32
Middle-sized oak, cut in spring	29

	<i>lbs.</i>
Middle-sized oak, cut in autumn, ...	21
Spanish chestnut	21
Ash	16
Blackthorn	16
Lombardy poplar	15
Hazel	14
Elm	13
Common willow (large)	11
Beech	10
Horse-chestnut	9
Birch	8
Larch, cut in autumn, ...	8

The bark and leaves of the alder have been sometimes employed in tanning, the whole tree being very astringent. The difference of seasons makes a considerable variation in the produce of tannic acid, cold springs causing a decrease to take place. Tannin most abounds when the buds are opening, and least in the winter. Four or five pounds of good oak bark, of average quality, are required to form one pound of leather. That well known and useful substance, cork, is the outer bark of a species of oak (*Quercus Suber*), which grows abundantly in the south of Europe.

Charcoal is obtained from the wood of the alder, birch, beech, elm, and other trees. That from the birch is the best suited for the manufacture of gunpowder. Charcoal burning

is a regular trade, followed in some of the woody districts by persons who do hardly any thing else. According to the experiments of COUNT RUMFORD, 1.000 parts of different woods yielded the following proportions of charcoal :

Fir	0.4418	Elm	0.4327
Lime	0.4359	Oak	0.4300
Poplar	0.4357	Maple	0.4223

The grouping or mixture of trees (as is well observed by C. W. JOHNSON, Esq., F.R.S. in his Prize Essay on Plantations) is a question which rarely engages the attention of the planter, although it is certain that, like the commonly cultivated crops of the farmer, some trees grow better when mixed with other kinds, than when vegetating in plantations of the same species : that they have certain secretions, and excrete matters both by their roots and leaves, which are noxious to other trees is equally apparent. Thus the ash and the locust do not thrive well in company with other trees. Others, on the contrary, thrive well together, such as the larch, the Scotch pine, the birch, and the Spanish chestnut. The oak, the elm, the hazel, and the hornbeam, are also good neighbours. The Roman planters evidently remarked this partial habit of trees. Thus they believed, that the elm was particularly grateful to the vine ; and were so convinced of an existent sympathy between them, that they named the elm the husband of the vine. It was invari-

ably their custom to plant them near each other ; and as we are indebted to the Romans for the introduction of the vine into England, so hence in all probability came with them also our first elm trees.

Woods, or collections of trees, may be considered under three divisions—

1. As simple plantations or forests, consisting chiefly of timber-trees, with little or no under-wood.

2. Coppice-woods, which are principally kept for the purpose of being cut over at certain periods, for their produce in bark, fuel, &c.

3. Woods, properly so called, which comprise a mixture of different kinds of timber-trees, and a proportion of undergrowth.

Which of these classes are the most profitable, and suited to different districts, must depend in a great measure upon local influencing circumstances, elevation, the nature of the soil, and the demand.

In raising belts, stripes, and all narrow plantations of wood for shelter, undergrowth should always be planted. Trees alone allow the wind to pass unchecked through their naked stems, and hence afford comparatively little shelter ;

but trees and underwood combined are like an immense hedge, equally thick from top to bottom, which checks the progress and retards the velocity of strong winds for thirty or forty feet above the surface. In most cases oak will be found the best kind of undergrowth.

For elevated and exposed situations, the larch is one of the most valuable of our timber-trees. In the north of Scotland it has been grown to a great extent, cultivated with particular attention, and found to be one of the most profitable of all trees to the planter, provided the land be well drained ; but it will not succeed in low, swampy situations. It grows with great rapidity, is subject to very few accidents, transplants with but little risk, and produces timber of great excellence and value, not only for domestic but for naval purposes. In most situations, even in very exposed places and thin soils, it outgrows all other timber-trees for the first ten or twenty years after planting, and, if planted in sufficient numbers as a nurse, it affords good shelter, while by its towering it tends to draw the trees up for timber.

The following list of trees and shrubs, from the *Gardener's Magazine*, is recommended as well-suited to endure the sea-breezes, and most eligible for plantations near the sea-coast.

Trees.—Common elm, wych elm, willow,

Huntingdon willow, oak, poplar, aspen, hazel, ash, wild cherry, hornbeam, birch, maple, service, lime, yew, sycamore, Scotch pine, larch, spruce fir, Weymouth pine, cluster pine, horse-chestnut, Spanish or sweet chestnut, alder, elder, laburnum. plane, holly. *Shrubs*—Tamarisk, Atriplex Halimus, A. portulacoides, Bupleurum fruticosum, Ruscus aculeatus: under tall trees, common dogwood, cornus sanguinea, common spindle-wood (*Euonymus Europæus*), common broom, and the furze.

When we consider, that there are upwards of 30,000,000 of acres of land in the United Kingdom at present lying waste, one third at least of which might be brought into profitable cultivation by planting; it does seem not a little surprising, that our statesmen and philanthropists should seek to alleviate the distress of our superabundant population by expatriation to distant shores, while so wide a field remains unemployed, and one which the tried experience of practical men has shown, to be fraught both with individual and national advantage. This is no wild and idle scheme: it involves no inroad upon private or vested interests—the adoption of it need not trench on a single acre devoted to the purposes of agriculture: on the contrary, the agriculturist and the planter may here go hand in hand, aiding and co-operating in this labour of love, which has for its object the improvement of our soil and climate; the increase of the

material for those “wooden walls,” which have so long proved our best bulwark and surest defence; and the furnishing labour and employment to a large number of “our bold” peasantry, the country’s pride.”

It is unnecessary, in a brief essay of this character, to adduce arguments in support of these opinions, or to go at length into the subject; but the following facts and calculations, from a prospectus of “The British Forest Planting Company,”—a company which I am surprised has never been carried into successful operation—are so pertinent, and so much to the purpose, that I may be pardoned for extracting them: “The great experience of the late DUKE OF ATHOL, who was by far the most extensive planter in the United Kingdom, entitles him to the highest confidence. In the Transactions of the Highland Society, are numerous extracts from his Grace’s memoranda, respecting his plantations at *Dunkeld* and *Athol*; and they exhibit in a most striking manner the immense increase of property that may be effected by planting. The Duke states, that the land upon which his plantations were made was not originally worth more than a rental of 9*d.* to 1*s.* per acre; but such was the effect of the amelioration of climate, and the improvement of the soil, produced by the foliage, that at the end of thirty years, when the last thinnings were removed, cattle were kept upon the land both summer and winter, and

showed the pasture under the trees to be worth 10s. per acre rental. Encouraged by such experience, the Duke planted, during the latter years of his life, 6,500 acres with larch only, which he confidently calculated would, in seventy years from the time of planting, be worth £1,000 per acre, even at the low price of 1s. per cubic foot, or less than one half the price at which he then sold; and that the timber would be fit for building ships of the largest class. The expense of planting and fencing did not in any case exceed £2, and the greater part was executed at 10s. per acre.

“But this vast improvement of property, great as it appears, might be equalled on several estates in England and Ireland, which are now comparatively worthless, or not feeding more than a few half-starved sheep; as, for instance, there is *Cannock Chase*, a wild waste of 13,000 acres, in the very heart of *Staffordshire*, capable, as the neighbouring plantations prove, of rearing the finest oaks for the supply of our navy. Now, if the noble owners had followed the Duke’s example, they would at this moment be in the receipt of large incomes from the thinnings of the forests which they might have created, and their heirs would rank among the richest men in the kingdom.

“Among the most distinguished writers on the subject, the late MR. PONTEY of *Hudders-*

field, the well known author of a Treatise on Planting, says, ‘ I have carefully calculated what might be reasonably expected from an *acre of land*, favourably situated and well managed in every respect, as a larch plantation, the result of which is, a net profit, after paying every expense, of much nearer *five* than *four hundred pounds* in forty-two years.’ As a confirmation of which it may be added, that a gentleman in *Bedfordshire* lately sold several acres of larch and fir, at £400 per acre, which had been planted only thirty-five years, on land that was not originally worth more than 2s. 6d. per acre rental. And in a more recent letter on the subject of a project of extensive planting, he says, ‘ the plan furnishes abundant facilities for producing such favourable results, as have been rarely seen and perhaps never been thought of.’

“ MR. MONTEITH, of *Stirling*, gives a detailed calculation, in the introduction to his *Forester's Guide*, of the planting and management of one hundred acres of land, chiefly with oak, stating the clear balance profit at the end of forty years at £41,000, after bearing a high rent and unusually heavy charges; and concludes with these emphatic words:—‘ Were I to live for forty years longer, I would undertake with any gentleman to rear up and give him, on the ground of one hundred acres of land, where he is perhaps not receiving 10s. per acre, the full value

here stated, without any additional charge of expenditure.'

“ The late MR. GEORGE SINCLAIR, who distinguished himself by his knowledge of, and writings on, both field and forest culture, and on whose accuracy, as a great practical planter and a nurseryman in extensive business, undoubted reliance may be placed; calculates that the thinnings on an acre of land of the value of 5s. or 10s. rental, planted with a mixed portion of larch, beech, pines, hazel, birch, and oak (the latter with a view to the growth of naval timber), will at the end of ten or fifteen years, according to local circumstances, repay the average expense of planting, rent, and management during that period, together with compound interest at £5 per cent.; and he estimates the profits of the future sales as follows:—In thirteen years, or at twenty-three years' growth, £24 : 10 per acre; in thirteen years more, or at thirty-six years' growth, £39 per acre; and after that period a triennial profit of about £12 per acre, until the oak left standing may be supposed to be fit for the naval yards.”

MR. WITHERS of *Holt*, a gentleman whose experience, and strenuous advocacy of an improved system of cultivating and rearing timber-trees, have added largely to our stock of knowledge on this important national subject, calculates, that a

plantation, managed according to his improved system of culture, due attention being paid to trenching, marling, and cleansing the ground, will realize in sixty-four years a net profit of £1300 per acre!

In the prospectus, from which I have already drawn so largely, an elaborate estimate is given, founded upon extensive experience and practical observation, of the outlay required for the purchase, planting, fencing, and subsequent management of an acre of land planted with larch, and also of the returns from the same during a period of sixty years. It appears from thence, that £21 : 11 : 3, expended in purchasing and planting an acre of land, will produce at the end of sixty years £1,446.

From these statements, which corroborate the opinion long entertained by the writer, it must be self-evident how profitable is the return made by planting for any outlay of capital, and how wide a field is open for speculating and enterprising individuals, in the cultivation of large tracts of poor and waste land, and the many mountainous districts with which our islands abound.

Passing, as these observations are likely to do, into the hands of a large number of noblemen and influential land-owners, it is to be hoped they will have the effect of stimulating

some few at least to new or increased exertions in the cause of planting, having for its object the growth of native timber, whereby we shall, as a maritime nation, be rendered less dependent upon extraneous sources for our supplies. Every such outlay of capital, how small soever it may be, besides the hundred-fold profit which it will necessarily bring to the adventurous and philanthropic spirit, will also minister to the comfort, and thereby diffuse gladness, among a large number of our labouring population, by affording employment at times and seasons when other labour is scarce, and in localities and situations where the benefit is likely to be duly appreciated. Holding up to commendation the noble example of the DUKE of ATHOL, the EARL of FIFE, the DUKE of DEVONSHIRE, and other spirited individuals, who have been extensive benefactors to their country, themselves, and their heirs and successors, by clothing the barren waste and the mountain-waste with fertility and verdure; we would say to each and all whose time and means permit—"Go, and do thou likewise!"

The law of timber. By timber in law is intended only such trees as are considered fit and proper, according to the local custom or usage, to be employed in building or repairing houses; and timber-trees are those which are of twenty years' growth (*Aubrey v. Fisher*, 10 East, p. 456).

The custom of the county or district naturally varies, with regard to the kind of trees which are considered to be timber. The oak, the elm, and the ash are, however, universally deemed to be such. In Buckinghamshire, beech is considered to be timber, and birch in Yorkshire (*Attorney General v. Fullerton*, 2 V. and B. 263), because it is generally used in buildings of an inferior kind. So also the chestnut, lime, walnut, and others may, under similar customs, according to the purposes to which they are intended to be applied, be considered timber. If pollards are sound, it seems they must be considered as timber, according to the opinion of *Chancellor King* (*Charmon v. Patch*, 5 Barn. and Creswell, 897).

The property of the tree is in the soil in which it grows; and though the roots may extend into two estates, yet it belongs to the owner of the land in which it was originally planted or sown (*Holder v. Coats*, 1 M. and M. 112—*Waterman v. Soper*, 1 Lord Raymond, 737—*Masters v. Pollie*, 2 Roll's Reports, 141).

Nurseries of young trees, raised for filling up orchards and plantations, cannot be removed by the tenant; but a nurseryman may remove his stock, upon giving up possession of the ground (*Wyndham v. Wray*, 4 Taunton, 316). The tenant for life, without impeachment of waste of an estate, may cut down timber in a

husband-like manner (*Burgess v. Lamb*, 16 Vesey, jun. 179): but the Court of Chancery will restrain such tenant from cutting down underwood of an insufficient growth (*Brydges v. Stephens*, 6 Madd. 149—*Attorney General v. Marlborough*, 3 Madd. 280); or ornamental or sheltering trees (*Lushington v. Balders*, 6 Madd. 149—*Attorney General v. Marlborough*, 3 Madd. 280): but this shelter or ornament is not to be construed to mean extensive woods (*Burgess v. Lamb*, 16 Vesey, jun. 175).

By presumptive custom, but not by common law, the trees growing on a copyhold estate may belong to the lord of the manor (*Whitchurch v. Holworthy*, 19 Vesey, jun., 213—4 Maule and Selwyn, 345). The copyholder is not guilty of waste if he cut timber merely for necessary repairs (*Doe v. Wilson*, 11 East, 56).

Timber-trees growing on the estates of ecclesiastical corporations, or the proceeds of sale, must be devoted solely to the repairs and beautifying of the Church (*Herring v. St. Paul's*, 3 Swanston, 509); and consequently neither the chapter nor corporation individually, nor the lessee, can fell the timber for their own use (*Windeston v. Wolgar*, 3 Swanston, 493).

A mortgagor cannot cut down timber if the land without it be a scanty security to the mortgagee (*Humphrey v. Harrison*, 1 J. and W.,

581); but the Court of Chancery will not restrain a mortgagor from cutting the timber, unless the security on the estate be insufficient without it (*Hippesley v. Spencer*, 5 Madd. 423).

Notwithstanding that the timber of an estate belongs to the landlord, as well as all such trees as are likely to become timber; yet the general property in bushes, underwood, coppice-wood, and such like, is in the tenant: and therefore the landlord cannot maintain an action of trespass against a stranger, for cutting bushes and thorns growing in a hedge, if the tenant's assent has been obtained (*Berriman v. Peacock*, 2 M. and Scott, 524).

The tenant or lessee has no right to cut timber; and in an action for waste, the defendant cannot give in evidence (even in mitigation of damages), that the timber was cut for the purpose of necessary repairs; or that, after it was cut, the timber was exchanged with the lessor's consent for timber more fit for the purpose intended (*Simmonds v. Norton*, 7 Bingham, 640). But he may fell timber without waste, which has been cut within twenty years; and in Kent they are in the habit of cutting trees of twenty-six or twenty-eight years' growth (*Woodfall's Landlord and Tenant*, p. 461).

Windfalls belong to the landlord, &c.; and the Court of Chancery will, if necessary, order

it to be preserved for him who has the first estate of inheritance in the land (*Bewick v. Winkfield*, 3 P. W., 268).

In most agreements between landlord and tenant, there is a clause binding the tenant not to lop, cut, or top any oak, ash, elm tree or tiller, or sapling, on the estate, except pollards; and that only for the loppings and toppings to be used for —, as the case may be, varying according to the customs of counties.

In all farming leases there are always some of the following covenants, according to the intentions of the contracting parties, or the usage of the district: lessee to repair fences and hedges: not to buckstall them, but to cut and scour one part of them yearly. Lessee to plash one part of the hedges yearly, to plant quicks and trees where needed, not cutting hedges under a certain growth, nor selling any for firewood. Lessee not to cut down and injure trees nor make pollards: not to cut pollards under — years' growth, nor any which have not been previously cut. Lessee not to cut underwood under — years' growth. Lessor to keep buildings in repair, to allow rough wood for repairing the gates. Lessor to find timber for repairs; to find timber upon notice, and to allow, if upon the farm, plough-bote (*Woodfall's Landlord and Tenant—Johnson's Farmers' Encyclopædia*).

By the Act 5 and 6 WILLIAM IV., c. 50, sec. 64, 65, no tree is allowed to be planted within fifteen feet of the centre of the highway; and with the authority of a Justice of the Peace (after duly summoning the owner to show cause) the surveyor of roads may order hedges and trees, which shade or otherwise injure highways, to be cut and plashed.

AN

ESSAY ON PRUNING

BY THE

LATE MR. JOHN SANDYS OF HOLKHAM,

ADDRESSED TO

M R. W I T H E R S.

Dear Sir,

As you expressed a wish some time ago, that I would give you a few hints on pruning trees, I have now endeavoured to comply with your request : and you will find, that I have mentioned most things necessary to be attended to in the management of plantations. I shall suppose that they are kept clean, and that the planting has been well done.

Plantations want pruning very soon after they are made, if heading down may be so called. Trees from two to four years old are in general the best to plant. After they have been planted

one or two years, many of them will be stunted in their growth, and not have a leading shoot: such trees should be cut down with a knife close to the ground, particularly oak, Spanish chestnut, ash, elm, and many others. Beech is rather an exception. If the plantation is properly managed, in three, or at most four, years, it must be attended to again (1*).

Those trees which were cut down must have all the shoots taken off at the ground *but one*, which is now left to be the tree; and some more bad growing ones perhaps had better be cut down (2).

The others, which are not cut down, may want a branch or two shortened, or a few taken close off, and the hazel (if any) cut close to the ground (3).

The nurse-trees, larch, birch, poplar, or whatever kinds they may be, must not be suffered to whip or damage those intended to stand for timber; but their branches must be shortened or taken off close, without regard to over pruning them, as they may be doing mischief to the others. This method may be continued another year or two, as the plantation may happen to thrive (4).

When the trees are grown so close that they

* These figures refer to the next communication.

meet together, and no weeds are likely to form a turf under them in future, some of the nurse-trees must be taken out; but only those which cannot be kept by pruning from doing damage to the principal trees: and it matters not how much they are cut away, rather than take them down. Every two years at least the plantation must be gone over in this manner with the nurses, and the trees to remain will want attention as to pruning. One leading shoot only must be left, and a few of the lower branches may be taken off; but be sure to leave a good head, as over pruning when young is a bad mode of treatment.

All small branches should be taken off with the knife, but for those too large for the knife the saw should be used, and in both cases quite close to the swelling produced on the stem; but by no means to injure that part, as it only increases the size of the wound, and it will be a longer time in barking over. The averuncator is a useful instrument for cutting off the branches high from the ground, such as double leaders, &c., and other branches rather too large for the knife, when done in proper time (5).

Before all the nurses are taken away, some of the timber-trees will want thinning. They should be cut close to the ground smoothly, and by a stroke upwards, as they are expected to produce underwood. As the timber-trees grow, they will want going over every two or three

years, both for thinning and pruning. The best of them should be relieved by felling on one side now, and the next thinning on the other, as the tops interfere with their neighbours, after which, some of the lower branches should be taken off to form a stem ; and if any are yet double headed that should also be attended to, but as they get older they will seldom do so ; and by all means *prune with moderation* (6).

As the trees grow to twenty or thirty feet high, they must be thinned and pruned in the same manner ; but by no means thin the heads as recommended by some authors, but leave them to their natural form of growth, except taking off lower branches to form a stem. When they get from thirty to forty feet high and upwards, they will want the lower branches taken off, whose leaves get sickly and have little growth them, as, by leaving them on longer, the knot in the timber will be larger. Their stems will now be half their height or more.

The locust or acacia, recommended by Mr. Cobbett, wants particular attention as to pruning when young, as it is apt to throw out several large branches. These being taken off in time, it will form a good timber-tree in a plantation (7).

In thinning, by all means attend to the underwood, so that the plantation be not blown through by the wind ; for being thin below is one

of the worst cases of bad management, and must be guarded against by not leaving the principal trees too thick. When trees are much waved about by the wind, they shew great neglect in former thinnings ; and the whipping of tops in windy weather, particularly in the spring, is exceedingly injurious, and is scarcely ever to be remedied by future thinnings. The best way is, if they be ash, chestnut, or any trees that shoot well from the ground, to take them close down.

In pruning plantations that are growing up, say thirty or forty feet high, be very careful not to take too many branches off the outside trees, a business scarcely ever attended to ; for, by pruning them high, the plantation looks thin and poor at a distance, and the cold is led more into the interior.

There is a method of pruning still practised by some persons, of leaving a foot or more of the branch on the tree to die and rot off, which, if it be only an inch in diameter, may take several years to accomplish, during which time the stem increases ; and, when the stump falls down, a hole is left as deep as the tree has grown since the swagging, which hole must have time to fill up after the rotten branch is gone. The healing of the wound is consequently delayed, and the defect in the timber greater (8).

Instead of taking off a large branch by the

stem, a great part of it may be cut off at a distance from it, leaving a small side branch to draw the sap and keep it alive, which is better than leaving a snag ; but this method should seldom be practised, *being only the result of former bad management*. In pruning young plantations the first or second time, branches may be frequently shortened or cut in, and it is often better than taking the whole off quite close (9).

In cutting down the underwood in plantations, not more than half the width of the plantations should be done at one time, the other half standing two or three years longer ; and in future cuttings down, some of the stools may be trained as wavers or undertrees, to fill up where there is room under the principal trees, and above the underwood, by which means the plantation will be thick in the middle as well as at the bottom, and not be blown through by the winds : also, if the plantation is narrow, and there is a strong hedge, it should be left for shelter till the underwood has grown a year or two ; but we frequently see both cut at the same time.

Where plantations generally called clumps are wanted for ornament, and are intended to be open groves when they are old enough not to be hurt by cattle, the principal trees must be left thinner than in woods, and allowed to form rather larger heads ; so that when they are thrown open to the lawn, they will not feel the

want of shelter so much, and be more beautiful to stand alone. The underwood may also be thinned by degrees, and some even left till the fence is taken away.

*The stem of a tree always increases according to the size of the head, as every healthy branch contributes to its growth (?)**. A tree but little pruned, and standing singly, will have a large head and short stem; and that stem will increase in size very fast, but not be so valuable from its deficiency in length. The branches will be large, and have much small crooked timber divided among them. A tree standing in a plantation follows the same law of nature; but, by judicious thinning and pruning, will form a stem of considerable length, while in a good growing state. Care must therefore be taken at all times to have a good head, if you mean to have stem; and *when you have length of stem, the head cannot be too large*. Thus the fewer trees you have on an acre of land the better, if the tops cover all the ground, for the timber will certainly be of larger dimensions and consequently the more valuable.

In plantations grown to timber-size, a tree that will square a foot is of considerably more value than four that square six inches each, as every carpenter can tell. And now we are mentioning timber, let us say a word or two

* See the Duke of Portland's Letter following Mr. Swift's Observations.

about the growing of it. Some great authors tell us, that timber cannot be good if raised any way by cultivation and manuring, and that every method employed must be as near nature as possible to make it valuable ; but if the experiments made by practical men may be depended upon, timber that has grown the fastest is the strongest and best. It follows, therefore, that land intended for planting (if not very rich) may be trenched and manured according to garden-practice for a common crop, such as potatoes and turnips.

I have thus put together the methods I have followed in pruning plantations for many years. They will not be of much use to you at present, as your plantations are under excellent management ; but they are yet young, and as my experience is of earlier date than yours, perhaps, as they get older, some of my hints may be of service to you.

Wells, December 3rd, 1829.

OBSERVATIONS

ON

MR. SANDYS' ESSAY,

BY

MR. SWIFT,

WOODMAN TO THE DUKE OF PORTLAND.

(1). HE highly approves of these directions.

(2). He considers it to be labour thrown away to have all the shoots taken off but one; and he says, that this practice has been very extensively tried in a large spring-wood in this neighbourhood, and that the result has been a great loss of underwood, without any the least benefit to the shoot which was left.

(3). He disapproves entirely of a branch being shortened, or any taken close off, as in all probability the trees will be damaged by it.

(4). He highly approves of this direction, which cannot be too much attended to.

(5). He is not sure what may be the effect on the stem by the practice here recommended. He is of opinion, that no trees with double leaders ought to be left in a plantation. He does not know, whether any precaution can prevent a faulty place in the part, where a double leader has been taken off.

(6). It is not quite clear, whether this refers to timber or spring-woods. He thinks, that, in the thinning of woods, regard must be had to the actual state of the individual trees.

(7). He has no experience of the locust-tree. Judging from other trees, he thinks the knot in the timber will not be made larger by leaving on sickly branches, and that it is mere loss of labour to remove them.

(8). He does not admit the fact to be as stated here: he thinks that, as the branch rots off, the bark closes gradually upon it.

(9). He thinks this very proper.

From his Grace the DUKE OF PORTLAND to
MR. WITHERS.

Sir,

IN a separate cover I return Mr. SANDYS' hints on pruning, with remarks made on parts of it by my woodman. He is now sixty-eight years old, and has been all his life-time a woodman. He came here about thirty years ago to take charge of the woods, and very soon after he became very fond of the method of pruning trees recommended by PONTEY; but he has lived to see the mischief done to the trees by the practice, and he has the good sense to acknowledge it. I think some of Mr. SANDYS' instructions very valuable, and I sincerely wish I had received them sooner. My plantations of oak have suffered much by the larches being allowed to overgrow them. It requires great resolution in a woodman to remove them when they are annually gaining so much value, as healthy larches gain at a certain period.

I must observe on the passage marked (?), that I believe it to be a mistake of the effect for the cause, that every healthy branch contributes to the growth of the tree. If the root of a tree is vigorous and it has room, it will extend its branches in all directions; but the branches will do it no good.

To ascertain this point, in the year 1829, I planted nine oak trees, four years old, on an old saw-pit that had been filled up in the middle of a wood.

Three of these trees I enclosed with bars, leaving only their heads out.

Three were stripped of their branches.

Three had their branches untouched.

The result is, that of the two latter divisions (the pruned and unpruned) nobody can now see the difference, without a very close examination of the bark, the pruned trees having put out new branches.

The first-named trees which were enclosed have greatly outstripped the others. The inclosure has every year been added to, so as only to leave their heads out ; and the trees themselves are now nearly double the size of the others which had more light and air. I am not surprised at this result, for it is exactly what happens in all thick woods.

I have the honor to be,

Sir,

Your most obedient Servant,

SCOTT PORTLAND.

Welbeck, March 13, 1834.

A P P E N D I X.

A P P E N D I X.

No. 1.

*Extract from the New England Palladium and
Commercial Advertiser of 27th March, 1835.*

PREMIUM ON LOCUST TREES.

THE Massachusetts Society for promoting Agriculture have awarded to MR. WILLIAM CLARKE, farmer, of this town, a premium of twenty dollars, as an expression of the estimation in which they hold his exertions in rearing a plantation of Locust-Trees. The committee states, that the importance of this tree can hardly be over-rated, either for purposes of timber or fuel; and that it combines rapid growth with great durability. Posts of this wood will last half a century and more. The ravages of the borer for a long time have laid waste this tree, but the insect is said to be fast disappearing. It is easily cultivated, attains a sufficient growth in ten or fifteen years, and brings a great price for ship-timber. Some trees in this vicinity have, within a few years,

been sold at sums, which would surprise those who have considered them good for nothing but shade.

No. 2.

FROM

THE PHILOSOPHICAL MAGAZINE,

MARCH, 1832.

Experiments on the Strength of different Kinds of Woods; made in the Carriage Department, Royal Arsenal, Woolwich. By Mr. PETER BARLOW, Jun. As. Inst. Civ. Eng.

THE following series of experiments, several of which I attended, being made on species of woods, the strength of which has not been previously ascertained, will I trust not be considered uninteresting to the readers of the Philosophical

Magazine and Annals ; particularly as the results are not only curious, but may probably lead to useful and important investigations, as connected with the introduction into and the growth of foreign timber in this country, as well as to important improvements in the present system of planting. Under this impression I have been induced to send them to you, as an addition to the several others on the same subject which have appeared at different times in this Journal.

The experiments originated in an investigation of the comparative properties of acacia and oak by W. WITHERS, Esq of Norfolk, whose object appears to have been to encourage the planting of the former in many situations instead of the latter, as a wood of great durability, and of quicker growth. In order to have a comparison made of their relative strengths, he forwarded specimens of both woods to Woolwich, and the results of the experiments will be seen in the following table.

Another question arose with Mr. WITHERS relative to the strength of oak, the growth of which had been encouraged by culture, compared with oak of the ordinary slow growth*. The specimens connected with the latter subject

* See a Letter to Sir Henry Steuart, Bart. on the improvement in the quality of timber, by W. Withers, Esq.

the author informs us, were received from Mr. W. BOORNE of Erpingham; the one from a fast and the other from a slow growing tree. They are marked Nos. 3 and 4 in the table of Experiments. The former was grown on a very good strong soil, its age was supposed about sixty years, and it contained from thirty-eight to forty cubic feet of timber: the other, No. 4, was about one hundred and twenty years old, and was grown upon light soil, with gravel about two feet below the surface. This tree contained about eighty cubic feet; but Mr. BOORNE considers, that if No. 3 had stood to attain the same age, it would have made at least forty feet more than that tree. The other two specimens were from trees furnished by Mr. SAMUEL FARROW of Diss, Norfolk, grown on the same piece of land: that from which No. 5 was cut, stood near the rack-yard of the farm by the side of a ditch, into which ran a great deal of moisture from the yard; and he has no doubt that, independently of the nourishment obtained by it from the ditch, very many of the smaller roots reached as far as the rack-yard; and the tree grew rapidly, and contained when cut down one hundred and twenty feet of timber. The tree from which No. 6 was cut, grew, as before stated, in the same field, but had none of the advantages above spoken of; but still the soil was good, with a lightish blue clay bottom. The tree grew well, but not in any degree so fast as the other; it contained about ninety feet of

timber, and it is the opinion of persons on the spot that they were both planted together.

Thus far the experiments were made with a particular object ; but as there were in store, in the Royal Arsenal, many woods, not in very common use, but which are grown abundantly in some countries, and from the appearance of which great strength was anticipated, MR. BOSSEY, foreman in the carriage department, was requested to prepare specimens, which were submitted to the same test as the former ones.

These results are interesting, some of the woods being more than double the average strength of oak : several of these specimens were sent from Berbice by CAPT. GIPPS of the Royal Engineers, who speaks very highly of their durability.

The apparatus made use of in the experiments consisted simply of two upright posts, fixed securely at one end in the ground, and at the other to the tie-beam of the roof of a shed ; on each of these were firmly attached two pieces of hard wood formed to an edge, on which the specimens to be experimented upon were placed, and a scale suspended from the centre to receive weights. To ascertain the relative stiffness or elasticity, the weight which caused a deflection of one inch was registered, which was denoted by a rod attached to the tie-beam so as to point

downwards in front of the middle of the specimen, and one inch below the upper surface ; so that when one inch of deflection had taken place, it was shown by the rod just passing clear of the piece under experiment.

In the Table, the first column contains the names of the woods ; the second the specific gravity ; the third the weight which caused one inch deflection, or one-fiftieth part of the length ; the fourth the breaking weight ; the fifth, the relative elasticity from the formula $E = \frac{l^3 w}{a d^3 \delta}$; the sixth, the strength from the formula $S = \frac{l w}{4 a d^2}$, where l is the length, a the breadth, d the depth, δ the deflection in inches, and w the weight in pounds ; by which they become comparative with the various experiments in BARLOW's Essay on the strength of timber ; and the last column contains any requisite description or remarks.

The pieces were each accurately cut and planed two inches square, and five feet in length ; and the distance of the props on which they were broken was exactly fifty inches : they were selected with great care by MR. BOSSEY, who assisted at the experiments, and registered and delivered the following results.

Table of the Strength and Elasticity of various Woods of English and Foreign Growth.

No. of Experiments,	Names of Wood.	Specific gravity.	Weight in lbs. which produced 1 inch deflection.	Breaking weight, in lbs.	Value of E from the formula $E = \frac{l_3 w}{4 a d^3}$.	Value of S from the formula $S = \frac{l w}{4 a d}$.	Remarks.
1	Acacia, English growth,	710	....	1195	.....	1867	
2	— ditto, ...	710	bore	1084	rope brok	e, the	piece little injured.
3	Oak, fast grown, ...	903	660	999	5156250	1561	First six specimens
4	— slow grown, ...	856	414	677	3234375	1058	supplied by Wm.
5	— fast grown, ...	972	550	999	4296875	1561	Withers, esq.
6	— slow grown, ...	835	439	943	3437500	1473	
7	— superior quality, ..	748	896	1447	7000000	2261	} Very fine specimens — been in store 2 years, been in store 16 yrs.
8	— ditto, ...	756	680	1304	5312500	2037	
9	Tonquin Bean {	middle	1036	1388	2414	10843750	3850
10		outside	1080	1332	2228	10406250	3481
11	Locust {	middle	972	1052	2116	8007812	3303
12		outside	936	940	2284	7343750	3568
13	Bullet Tree {	middle	1029	1360	1724	10625000	2696
14		outside	1029	1332	1668	10406250	2606
15	Greenheart .. {	middle	1015	1332	1892	10406250	2956
16		outside	986	1388	1612	10843750	2562
17	Cabacally {	middle	907	952	1668	7437500	2606
18		outside	892	940	1556	7343750	2431
19	African Oak .. {	middle	972	1168	1447	9132812	2261
20		outside	972	1168	1657	9125000	2589
21	African Oak .. {	middle	1015	1288	1643	10062500	2567
22		outside	972	1097	1643	8570312	2567
23	American {	middle	648	775	1279	6054687	1967
24		outside	633	775	915	6054687	1430
25	Black Birch .. {	middle	648	644	1027	5031250	1604
26		outside	669	831	1433	6492187	2239
27	Common Birch {	middle	792	800	1164	6250000	1820
28		outside	630	884	1304	6908250	2037
29	Ash {	middle	727	660	1304	5156250	2037
30		outside	702	660	1304	5156250	2037
31	Elm..... {	middle	554	436	772	3406250	1206
32		outside	532	324	660	2531250	1031
33	Christiana {	middle	698	856	1052	6687500	1644
34		Deal {	outside	680	772	940	6031250	1480
35	Memel Deal.. {	middle	590	786	1108	6140625	1731
36		outside	590	856	1108	6687500	1731

It is to be regretted that the results of the acacia were not more particularly noted ; but not

having in view at that time to carry on so extensive a course of experiments, means were not taken to ascertain its stiffness. The second specimen, after the rope broke, was found but little injured by the experiment, which certainly indicates considerable power of elasticity, although the exact amount was not numerically ascertained. This specimen was preserved unbroken. Upon the whole, however, it has the advantage of the oaks in strength, except those marked No. 7 and 8, which were remarkably fine specimens; but it will be found by referring to BARLOW'S Essay to greatly exceed the strength of oak in general.

The results of the oak experiments seem certainly to be in favour of the fast grown. "These experiments," MR. WITHERS observes, "throw new light upon the subject, and lead to the most important conclusions. They prove not only that fast growing timber is superior in quality to that of slower growth, but that by the constant application of manure to the roots of trees planted even in good soil, nearly double the quantity of timber may be obtained in the same period, while its strength instead of being diminished will be thereby increased."

No. 3.

ACACIA TREE,

*From the Farmer's Encyclopædia, by CUTHBERT
W. JOHNSON, ESQ., Part 1, Sept. 1841.*

THE Acacia tree is well known in America, from which it was introduced by the name of the Locust tree. It grows very rapidly in the early stages of its progress; so that in a few years, from seeds, plants of eight and ten feet high may be obtained. It is by no means uncommon to see shoots of this tree eight or ten feet high in one season. The branches are furnished with very strong crooked thorns; the leaves are winged with eight or ten pairs of leaflets, egg-oblong, bright green, entire, and without foot-stalks. The flowers come out from the branches in pretty long bunches, hanging down like those of the laburnum, or the still more lovely *Wistaria sinensis*. Each flower grows on a slender foot-stalk, smelling very sweet. It is of a white colour, but there is a rose-red variety. It blows in June; and when the tree is full of bloom makes a handsome appearance, and perfumes the whole air around. The flowers are followed by seed-pods, oblong, flat, having a longitudinal rib next the seeding suture, on the outside

of that being drawn out into a membranous margin; one-celled, and two-valved. The seeds are sometimes as many as sixteen, kidney-shaped, ending in a hooked beak, like a lens, and are of a rusty colour.

In North America, where this tree grows to a very large size indeed, the wood is much valued for its duration. Most of the houses which were built at Boston in New England, on the first settling of the English, were constructed of this wood; and since then it has been much used in America for various purposes.

The seeds of the Acacia tree were first brought to Europe by M. JEAN ROBIN, nurseryman to the KING of FRANCE, and author of a "History of Plants." M. ROBIN brought the first seeds from Canada; in consequence of which, succeeding botanists have, in honour to his name, termed the genus *Robinia* to which the Acacia tree belongs. Soon after its introduction into France, the English gardeners received seeds from Virginia, from which many trees were raised.

PARKINSON, who mentions the Acacia tree in his "Theatre of Plants," which was published in 1640, says it was then grown of an exceeding height by JOHN TRADESCANT; and EVELYN recommended it to the notice of the nation in his "Sylva," which was presented to the

Royal Society in 1662. In this work he observes, that the *Acacia* is well deserving of a place among our avenue trees, which is so well adapted to the adorning of our walks with its beautiful leaves and sweet flowers.

There appears to have been very little notice taken of the *Acacia* tree till BRADLEY's time, in 1720 ; and he mentions only a few trees growing in the court before Russell-House, Bloomsbury, and in the Old Palace Yard, Westminster. MORTIMER afterwards tells us, that a goodly number of *Acacias* were formerly planted in St. James's Park ; and that in consequence of the high winds shattering some of their branches, they were all ordered to be cut down. We wish that the hint had been then taken, that the tree wanted only the shelter of the numerous offspring of our woods, in order to show its native dignity and spread its usefulness. The wood, when green, is of a soft texture, but becomes very hard when dry. It is as durable as the best white oak of North America, and esteemed preferable for axletrees of carriages, trenails for ships, and many other important purposes. The turner finds the wood of the *Acacia* hard and well suited to his purpose, and is delighted with its smooth texture and beautifully delicate straw colour.

The tree, when aged, abounds with certain excrescences or knots, which, when polished,

are beautifully veined, and much esteemed by the cabinet-maker. It makes excellent fuel, and its shade is said to be less injurious than that of any other tree : while the leaves afford wholesome food for cattle. A gentleman in New England sowed several acres of it for this purpose alone.

It has been employed with signal success in Virginia for ship-building; and is found to be very superior to American oak, ash, elm, or any other wood they use for that purpose. In New York it has been found, after repeated trials, that posts for rail-fencing, made of the *Acacia* tree, stand wet and dry near the ground better than any other in common use, and will last as long as those of swamp cedar.

The *Acacia* tree seems happily adapted to ornamental planting. Whether as a single tree upon the grass, feathering to the ground line, or as a standard in the shrubbery, towering above a monotonous mass of sombre evergreens, the *Acacia* has great charms for us, and may justly be called a graceful tree ; and, although its light, loose, and pleasing foliage admits the light, and seems to harmonise so delightfully with the polished lawn, or the highly cultivated shrubbery (and there is hardly a shrubbery to be found without them), yet we should like much to see the *Acacia* tree planted in the

woods every where, where forest-timber is an object of attention.

In France, the *Acacia* tree appears to have been more generally diffused throughout the country than with us: for it does not only ornament their gardens and shade their public walks, but the sprightly foliage of this beautiful tree shines through their woods and forests in every direction, so much so that it might be taken for an indigenous inhabitant of the soil.

In one of the *Memoirs* by the Agricultural Society at Paris, the properties of this tree are very highly extolled. Its shade, it is said, encourages the growth of grass. Its roots are so tenacious of the soil, and shoot up such groves of suckers, that when planted on the banks of rivers it contributes exceedingly to fix them as barriers, to check the incursions of the stream. *Acacia* stakes, too, are more durable than any other known wood.

The choicest pieces only of the best oak timber are applied to the purpose of trenail-making in ship-building; and, as the *Sussex* oaks are generally reckoned the best, most shipwrights, even in the north, have them from thence, and the demand for them is so great, that trenail-making is there become a very considerable manufacture. If it be proved that the *Acacia* tree is equal to our best oak for this important pur-

pose in our naval architecture, then do we strongly recommend (and we write practically) to every landed proprietor to plant the *Acacia* as a forest-tree, more especially as it will grow upon almost any description of soil, but more particularly upon sandy or gravelly shallow soils, where the oak does not thrive.

In forty years, the *Acacia* tree will grow sixty feet high, and will girth six feet, three feet from the ground; and, although brittle in a young state, the characteristics of the timber of a grown tree are toughness and elasticity.

There are many fine stately *Acacia* trees on the banks of the Thames. On the estate of his Grace the DUKE OF DEVONSHIRE, at Chiswick House, there are some remarkably fine trees, which, from their size and appearance, we have no doubt were among the first introduced to this country.

In the pleasure grounds at Sion House many fine old *Acacia* trees are to be found, and several groups in the park there. But the finest, perhaps, in England, are growing on Claremont estate, Esher, Surrey. SIR ROBERT GARDENER occupies a small portion of this domain, at Milbourne, where may be seen some *Acacia* trees eighty years old. One, in particular, measures eleven feet in circumference three feet from the ground, tapering but very little till it sends out its

lofty branches from the trunk, at about fifteen feet from the ground, and is now perfectly sound. The extreme altitude of this remarkable tree is seventy feet ; forming, by the deep indentures of its bark and fine large limbs, a truly picturesque as well as an ornamental tree.

There are numerous *Acacia* trees throughout the grounds at Claremont, measuring seven and eight feet in circumference two feet from the ground, which, although growing in exposed situations, exhibit no symptoms of being shaken or unsound. It is worthy, perhaps, of observation, too, that these trees are growing upon very shallow soil, where the under-soil is nothing but sand and gravel. In the grounds of SIR WILLIAM COOPER, of Isleworth House, there are also some very fine *Acacia* trees, not measuring less than eight feet in circumference three feet from the ground. There are, perhaps, more *Acacias* in the counties of Middlesex and Surrey, than in any other counties in England, but chiefly confined to the shrubbery and the lawn. In many parts of Scotland the *Acacia* tree grows extremely well, and many very fine trees are to be found in the neighbourhood of Edinburgh. SIR JOHN NASMYTH, Bart. has one at Dalwick, in Tweeddale, which measures between five and six feet in circumference about three feet from the ground, and six feet six inches close to the ground. But the finest group of these trees we have ever seen in this country, are at Niddrie

Mareschall, near Edinburgh. One of these measures upwards of nine feet a few inches above the ground. Another tree in the same group, at three inches from the ground, measures six feet six inches round the base; and there is a third *Acacia* belonging to them that measures six feet five inches at two feet and a half from the ground. The *Acacia* also thrives well in Ireland, and there are many fine healthy trees in the neighbourhood of Dublin. It grows more rapidly in that country than it does in either England or Scotland. In the different States of Germany the *Acacia* seems to bear the rigour of their winters, and grows to a fine ornamental tree.

As a durable timber, it has been proved that nothing can exceed the *Acacia* wood, when of proper age. But there is one important use to which these trees may be applied, which has hitherto escaped the notice of the planter, namely, hedges. From its rapidity of growth it forms a fence capable of resistance in one fourth of the time of any other plant hitherto used for that purpose. Had we to fence in a whole estate, we should, in preference to all others, plant *Acacias*. They bear clipping, and may be raised to twenty or thirty feet high, if required, and are so strong that no animal can force through them. Fences of this kind are common on the Continent, but generally of hornbeam. The only instance of an *Acacia* hedge we know

of is to be seen round part of the boulevard of the city of Louvain. Plants for this purpose should be taken from the nursery-lines four feet high. At every point where the stems cross one another, a natural union or grafting takes place, and, as the stems increase in size, the spaces between will gradually decrease; so that in the course of a few years the fence becomes a complete wooden wall, not occupying a space more than twelve or fifteen inches, forming a barrier that no animal can force. Fences of this description may either be made on the level ground, or concealed from the distant view.

We are at a loss to account for the name commonly given to this tree by the Americans, namely Locust-tree; for the Locust-tree (*Hymenæa Courbaril*) is a native of South America.

In the arboretum of the gardens of the Horticultural Society of London, there is a proof, perhaps the very best proof that this country affords, of the great rapidity of growth, and also the beauty of this truly interesting and highly valuable tree. About twelve years ago, this arboretum was planted for the express purpose of introducing the trees of all countries—the research of enterprising men. The Acacia was planted with the other individuals of this very splendid collection; and the result has been, that the Acacia has made greater progress than any of the oaks, the ash, the elm, the maple, or in-

deed, any of the hard-wooded timber-trees within the wall of the gardens.

The *Acacia*-trees, in their rapidity of growth, are exceeded only by a few of the poplar and willow tribes.

There is a singular character about the suckers of this tree. They are rarely seen to appear on the lawn, but in the shrubbery frequently. They rise singly, not like the elm and other trees, in thick masses, choking one another, but they start out of the ground at once, with all the boldness and vigour of a healthy shoot from a powerful stool; and in a sheltered situation will grow, the same year, from twelve to fifteen feet long from the ground; and it is the more remarkable, that these suckers grow in this vigorous way immediately under the shade of the parent, and other large trees. What is also very singular, so strongly are they attached to the root below the ground, at the insertion, that they are very rarely from accident displaced.

MR. WILLIAM LINDSEY mentions a very striking instance of the astonishing rapidity of the growth of this tree. He observed a strong shoot make its appearance in one of the woods at Chiswick, and he had the curiosity to see what would be the result by applying a stake to this sucker for protection. By the end of the season, it was twenty feet high, and measured three inches in

circumference. When the full-grown old *Acacia*-trees are felled, the following year hundreds of suckers will start up from the roots in all directions, and grow as freely as if a fresh plantation had been carefully made. So that, on the score of economy, we know of no tree that can be planted equal to the *Acacia*. As an under-wood, it far exceeds any other tree in produce; and for stakes, arbour-poles, hop-poles, and pale fencing, there is no wood equal to *Acacia*. In America, the use of the *Acacia* has been confined to trenails of ships, in consequence of its scarcity. But were it, either in that or this country, as plentiful as oak, it would be applied for more purposes in naval architecture, such as knees, floor-timbers, and foot-hooks, being far superior to oak for its strength and duration; and from the tree arriving much sooner at perfection, and spreading into so many branches, it affords full as large a proportion of crooks and compass-timber as the oak tree.

A cubic foot of *Acacia*, in a dry state, weighs from forty-eight to fifty-three pounds' weight. If we compare its toughness, in an unseasoned state, with that of oak, it will not be more than 8-100 less. Its stiffness is equal to 99-100 of oak; and its strength nearly 96-100; but, if it were properly seasoned, it might, possibly, be found much superior to oak in strength, toughness, and stiffness. A piece of *Acacia*, unseasoned, two feet six inches long, and an inch

square in the vertical section, broke when loaded with a weight of two hundred and forty-seven pounds avoirdupois. Its medium cohesive force is about 11-500 pounds. (*Dictionary of Architecture.*)

We are not aware that this tree has added in any shape to the list of medicines. The Acacia of the shops was formerly made from the unripe pods of the true Acacia tree ; but of later years, the Acacia Germanica of the shops is made from unripe sloes, and is preferred as an astringent medicine to the true Acacia.

The Acacia is easily propagated from seeds or suckers. (*Miller.*)

No. 4.

FROM THE PENNY CYCLOPÆDIA,

Vol. 20, p. 45.

THE best known species of Robinia is the *R. Pseud-Acacia*, the Bastard or False Acacia, or *Locust-Tree*. It has stipular prickles with loose pendulous racemes of white sweet-smelling flowers, which as well as the legumes are smooth. This tree which is now so well known, was first grown in Europe by VESPASIEN ROBIN, the son of the botanist, after whom the genus was named, in the *Jardin des Plantes* at *Paris*. It was named Locust-tree by the missionaries, who believed it to be the same tree as that which grows in Asia, and is supposed to have produced the locusts spoken of in the New Testament. It was one of the first trees received in Europe from North America, where it grows in great abundance. It grows in the Atlantic States of North America, but it is very abundant in the south-west, in the valleys of the Alleghany Mountains. It is also found in the Western States, and in Upper and Lower Canada.

Since its first introduction into Europe, this tree has met with very different treatment, at one time being extolled as the most valuable of trees, at another time condemned as worthless. This has arisen in a great measure from the soils and situations in which it has been accidentally cultivated. It has always been known in America as affording an exceedingly hard and durable wood: hence it has been recommended to be cultivated on this account. In America it is used for making posts, and occasionally trees are found large enough to be employed in ship-building; but its greatest consumption is for making trenails, by which the timbers of ships are fastened together, and for this purpose large quantities are used in the royal dock-yard at Plymouth, which are imported from America. Cattle are fond of the young shoots, and on this account it has been recommended to be cultivated as forage. At one time, it was thought to be an excellent tree for planting on the banks of rivers and canals, as the roots, being very large and spreading, would bind the soil together.

In 1823, COBBETT wrote on this tree, recommending it strongly in his various publications. He imported immense quantities of the seeds from America, for the purpose of growing the plants for sale. He stated, that in this way he had distributed in Great Britain more than a million of plants. The tree is of rapid growth when young, and forms heart-wood at a very

early age. In America it attains a height of seventy or eighty feet, but in this country it is seldom seen so high. Its tendency to form branches, even when young, prevents its being used for hop-poles as recommended by COBBETT. The roots and other parts of the plant, like many of its order (*Leguminosæ*), contain a saccharine principle, which accounts for the nutritive properties of the leaves. In St. Domingo, the flowers are used for making a distilled liquor, which is said to be very delicious. It folds up its leaves at the approach of night. The tree grows best on a soil of sandy loam, rich rather than poor: a good garden soil is the best. It should not be planted in exposed situations, as from the great brittleness of its branches it is likely to be destroyed by winds. It may be propagated by cuttings from the roots, or by planting large truncheons or suckers; but producing it from seeds is the best mode. The seeds should be sown in the spring, and in the summer of the following year they may be transplanted. The seeds will not retain vitality more than two years. American seed should always be used, as it does not come to perfection in this country.

No. 5.

FROM BAXTER'S AGRICULTURAL LIBRARY.

LOCUST-TREE.

Robinia Pseudacacia, Diadelphina Decandria,
LINN.—*Nat. Ord. Leguminosa*—JUSS.

THIS is a hardy, fast-growing, thorny tree of middling stature, of no great beauty as a tree, but ornamental when young, and very well adapted for coppice-wood and rough timber. The leaves come out late in spring, and fall off early in autumn, like those of the ash.

Culture, &c. Soil. It will grow in almost any soil, but succeeds best in a deep rich loam and sheltered situation. Propagated by seeds, which may be sown in beds towards the latter end of March or beginning of April. If sown thinly, and the ground be good, the plants will attain the height of four feet by the month of October, and may then be planted out into nursery-lines, and after one or two year's growth may be planted out where they are to remain. This tree succeeds best when planted out young;

for from the nature of its roots, which are long and thinly furnished with fibres, it seldom succeeds well if planted when of a large size.

Use. 1. In this country, the locust-tree is chiefly cultivated as an ornamental tree in the shrubbery. 2. In North America, the timber of this tree is much valued on account of its durability, being much superior to oak for its strength and duration.

No. 6.

FROM PHILLIPS'S SYLVA FLORIFERA.

*Acacia—Robinia Pseudacacia—Natural Order,
Papilionaceæ or Leguminosæ—A genus of
the Diadelphia Decandria Class.*

Light-leaved acacias, and the shady plane,
And spreading cedar, grace the woodland reign.

BARBAULD.

ALTHOUGH we are far from being amongst the number,

“ Whose proud disgust and scorn
 Detest those treasures which at home are born ;
 Who feel no joy, though spreading to the air
 His pompous trees their verdant branches rear,
 Unless from Afric's soil their rise they boast,
 From India's deserts, or Columbia's coast.

But if some foreign tree, of noble size,
 With boughs majestic, should adorn the skies,
 Our forest-natives, with attention meet
 And hospitable care, the stranger greet,
 Pleased 'mongst themselves his future dwelling make,
 Not for his scarceness but his beauty's sake :
 If haply profit too should join with grace,
 To civic honours they admit his race.”

DELILLE.

Of all the exotic trees with which we have adorned our native groves, the North American stands first. We have no tree that displays more elegant foliage than is formed by its pinnated leaves, which appear so judiciously scattered over the branches, that not one obscures its fellow ; and their feathery lightness is only surpassed by the pleasing emerald tints with which they are coloured : nor are its bunches of pendant papilionaceous blossoms less acceptable for succeeding the more gaudy laburnum, and thus lengthening the charms of spring. The sweet perfume with which they scent the surrounding air only makes us regret their short duration ; but to these succeed pods of so rich an umber brown, that autumn seems to peep through the veil of spring, and repay us for the loss of its orange-flower odour : whilst the nightingale loves to confide her nest to this new in-

habitant of our climate, whose long and strong thorns seem to insure her family a protection, and she descends to the lower branches to ravish our ears with her sweet melody.

“Nor rural sights alone, but rural sounds
Exhilarate the spirits, and restore
The tone of languid nature.”

COWPER.

We cannot with indifference behold this tree, which the uncivilised natives of America have consecrated to the genius of chaste love. These proud children of the desert are not less susceptible of the pangs which Cupid occasions, than the more polished inhabitants of Europe; nor are they less delicate in expressing their sentiments, which, instead of flattering words, are told by a branch of acacia in blossom. It is natural to suppose that this seducing language is as well understood by the young savage of the forest, as by the tutored coquette of the city. The introduction of American plants into Europe made a change in the system of botany absolutely necessary; for that, which had been arranged by TOURNEFORT and others, was found impossible to be applied to the plants of the new world. This tree, when first introduced, was supposed to be a species of the *Acacia* known in the ancient world, because its thorny branches and winged leaves bore resemblance to the Egyptian thorn, or binding bean-tree. But by the system of LINNÆUS we discover, that it cannot be ranged in the same class or order as the

true Acacia. It is therefore commonly called the false Acacia, while in America it is named the Locust-Tree. We have now collected thirteen different species of this tree, all of which bear the generic name of *Robinia*. Europe owes this vegetable beauty to MONSIEUR JEAN ROBIN, nurseryman to the KING of FRANCE, and author of a "*History of Plants*," who first brought the seeds from Canada; and in gratitude for the gift, botanists have given it the name of *Robinia*. Soon after its introduction into France, the English gardeners received seeds from Virginia, from which many trees were raised. PARKINSON observes in his *Theatre of Plants*, which was published in 1640, that "it was grown of an exceeding height by Mr. TRADESCANT;" and EVELYN recommends it to the nation in his *Sylva*, which was presented to the Royal Society in 1662. In this work he says, "The Acacia deserves a place among our avenue-trees, adorning our walks with their exotic leaves and sweet flowers: very hardy against the pinching winter, but not so proof against its blustering winds." This great man, who so eminently displayed his desire to embellish and enrich his native country, by plantations, adds, "I would encourage all imaginable industry in such as travel foreign countries, and especially gentlemen who have concerns in our American plantations, to promote the culture of such plants and trees, especially timber, as may yet add to those we find already agreeable to our climate."

These observations appear to have met with little attention, as the tree seems to have been rare in 1720, when BRADLEY notices it as growing in the court before *Russell-house, Bloomsbury*, and in the *Old Palace-Yard, Westminster*. In both of these situations their roots have given place to flag-stones, brick, and mortar—their trunks to lamp-posts, and their waving branches to clouds of coal-smoke. MORTIMER says, “a great number of them were formerly in *St. James’s Park*, and that, in consequence of some of their branches being broken by the wind, they were all cut down.” This graceful tree is to be found in every well planted shrubbery, yet it meets the eye less frequently than could be wished by the admirers of beautiful scenery; while in France it not only ornaments the gardens, and shades the public promenades, but its winged leaves shine through their woods and forests, so as to give an idea of its being a native of the soil. There it adds utility to luxury, and profit to beauty; for the turner finds the wood both hard and firm, while the joiner uses it for durability, and the cabinet-maker for the beauty of its yellow and brown veins: nor must we forget a singular quality in this tree, which is, that it burns well even on the day that it is felled—a property of no small importance to a country, where wood continues to be the only fuel.

This tree grows from fifty to seventy feet in height, and so rapidly when young, that it is

not uncommon to see shoots of this tree six or eight feet long in one summer. In New England, we are told of a Robinia-tree of forty years old, that was in 1782 sixty feet high and four feet ten inches in girth, at three feet from the ground. This timber has been employed with success in Virginia, for ship-building, and found to be far superior to American oak, elm, or ash, for that purpose: it is even said to be as durable as the best white oak, and esteemed preferable for axle-trees of carriages, trenails of ships, &c.

Most of the houses which were built at *Boston* in New England, on the first settling of the English, were constructed of this timber. The native Americans make their bows of this wood, and point their arrows with one of its thorns. Its tap-root, when cleared of the bark, has an agreeable perfume. We are told in MARTIN'S *Edition of MILLER*, that SIR GEORGE SAVILLE had in 1807 planted many thousands of these trees at *Rufford*: and we feel confident that they will ultimately benefit his estate, notwithstanding the character given them by most English writers, that their branches are subject to be broken by the winds in summer. We have seen them so shattered in situations injudiciously chosen, while on the banks of the Thames, and in other sheltered spots, we have remarked them of more considerable age and magnitude than even in France.

The Acacia Robinia seems particularly adapted to ornament the modern villa: its light and loose foliage, that pleasingly admits the light, seems to harmonize better with the trellis-work of the veranda than any other flowering tree; while the grace of its bend, and the gaiety of its head, correspond with the nicety and cheerfulness of this style of building, which has of late years so greatly embellished our country. Nothing perhaps displays more conspicuously than this the liberty of the people, and the equity of the laws, that protect the lone-cottage more securely than any ramparts or moats could have protected our forefathers, who found no security but in their castles, or the walled towns, where their reliance was on their numbers. These towns were called *villæ*, and from whence we have derived the name of villa for detached country dwellings: and as long as our liberties and laws remain unimpaired, so long will the acacia wave its banners in security over our peaceable villas.

In placing this tree in the shrubbery or plantation, a sheltered situation should be chosen. It is a beautiful tree, either to look through, or to look down upon; and it is equally ornamental when it feathers to the ground, or carries its plumage above ever-green shrubs, which its shade injures less than that of other trees, and it is certainly less hurtful by its drip than any tree we know of. This may be accounted for from a

singularity in the nature of its pinnated leaves : they fold over and join their upper surfaces in bad weather, leaving the tree as it were stripped of half its foliage ; while the rain is conducted by the branches to the trunk, and from the trunk conveyed to the root. These winged leaves expand themselves again in fine weather to exhale oxygen gas ; but at the approach of night they again close their leaves as if to sleep, and are thought to give out carbonic acid from their under surface. An infant, who had observed this natural phenomenon from its nursery-window, observed “It was not bed-time, for the acacia-tree had not begun its prayers.”

“Thus every object of creation,
Can furnish hints to contemplation :
And from the most minute and mean,
A virtuous mind can morals glean.”

GAY.

The Robinia, or false Acacia, is not delicate as to soil, for it will grow in earth of every kind, but prospers best in such as is light and sandy. The finest trees are those raised from seed, which should be sown in light earth, about the end of March, and in about six weeks the young plants will appear. They may be transplanted the following year, for all trees that have a tap root it is advisable to transplant young. This tree is also propagated by suckers and cuttings, but these trees seldom prove so handsome as those raised from seed.

No. 7.

ROBINIA PSEUDO-ACACIA.

THIS is a large and handsome tree, of quick growth, beautiful in foliage, and highly ornamental, when laden in summer with bunches of white sweet-scented flowers, resembling those of the laburnum in size and position. The branches are liable to be shivered off by our autumnal storms. MR. PURSH says, the wood is almost incorruptible, and particularly calculated for gates and fences: the leaves deciduous, a span long, of a peculiarly pleasant light green, consisting of many elliptical, opposite, or alternate, stalked leaflets. The short oval-shaped stipules become rigid spines. Legumes pale, very compressed, two or three inches long.—*Rees's Cyclopædia*.

No. 8.

FROM DR. WILlich'S DOMESTIC ENCYCLOPÆDIA.

ACACIA, in botany Egyptian thorn, according to LINNÆUS, is a species of *mimosa* growing in Egypt. It is also to be found in North America, and is there called the *locust tree*. Its culture is not difficult. It delights more in a dry, sandy, and elevated soil; but may be raised in any, either from seeds or slips. Its uses are various, as it is applied both to domestic and 'medicinal purposes. An inspissated juice of its fruit, of a dark colour and firm consistence, has been brought to us from Egypt: when dissolved, it is used in any convenient liquor for relieving spit-tings of blood, complaints of the eyes, and quin-sies. The leaves of acacia are said to afford an agreeable nourishment to horses and horned cattle. They may be given either green or dry, alone, or mixed with hay or chopped straw. The flowers of the acacia are used by the Chinese in making that beautiful yellow, with which they stain their silks and stuffs, and colour their paper, in the following manner: Take half a

pound of these flowers before they are fully blown, and roast them over a clear and gentle fire, in a very clean copper pan, continually stirring them with a brisk motion: when they begin to turn yellow, pour on a little water, and let it boil till it becomes thick, and acquires a deep colour; then strain the whole through a piece of coarse silk. To the liquor thus expressed, add half an ounce of alum and one ounce of calcined and finely powdered oyster-shells: when the whole is well mixed it will be fit for use. The origin of the bezoar has been attributed to the seeds of this plant, which, being browsed by certain animals, have, by their great acidity and astringent qualities, caused a condensation of the juices of the stomach and produced this celebrated concrete. The acacia or locust-tree of North America, has been applied to various parts of ship-building; and several gentlemen in the state of New York have, after repeated trials, found, that posts for rail-fencing, &c. made of this tree, have resisted the influence of the weather better than any other timber, the swamp-cedar even not excepted. In England the acacia tree is an exotic, and on account of its being imported from a warmer climate, is erroneously supposed to be of a tender and delicate nature; and has, therefore, been propagated in a luxurious soil.

THE END.

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